

المواصفات القياسية الإماراتية

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بطاقة البيان - بطاقة بيان كفاءة الطاقة للأجهزة الكهربائية

الجزء التاسع: المكانس الكهربائية

Labeling – Energy Efficiency Label for Electrical Appliances

Part 9: Vacuum Cleaners

دولة الإمارات العربية المتحدة

UNITED ARAB EMIRATES

ICS:

جميع حقوق الطبع محفوظة

## الجزء التاسع: المكانس الكهربائية

**Labeling – Energy Efficiency Label for Electrical Appliances  
Part 9: Vacuum Cleaners**

المواصفات القياسية لدولة الإمارات العربية المتحدة  
Standards of United Arab Emirates

	تاريخ اعتماد مجلس الوزراء
	تاريخ النشر بالجريدة الرسمية
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ICS:

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## تقديم:

وزارة الصناعة والتكنولوجيا المتقدمة هي الجهة المسؤولة عن أنشطة التقييس بالدولة ومن مهامها إعداد المواصفات القياسية أو اللوائح الفنية الإماراتية بواسطة لجان فنية متخصصة.

وقد قامت الوزارة ضمن برنامج عمل الفريق الفنية "برنامج كفاءة الطاقة الكهربائية بإعداد المواصفة القياسية الإماراتية رقم 5010-9 لعام 2021 "ببطاقة بيان كفاءة الطاقة للأجهزة الكهربائية الجزء 9: المكانس الكهربائية".

وقد اعتمدت كلائحة فنية وذلك بموجب قرار مجلس الوزراء رقم ( ) بتاريخ / / هـ، الموافق / / 2021م.

## Foreword

Ministry of industry and advance technology (MOIAT) has a national responsibility for standardization activities. On of MOIAT main functions is to issue Emirates Standards/Technical regulations through specialized technical committees (TCs).

MOIAT through the technical program of committee "Technical committee for program of Energy Efficiency Electrical Vacuum Cleaners has prepared the UAE Standard No. UAE.S 5010- 9:2021 "Labeling — Energy Efficiency Label for electrical appliances — Part 9: Household Vacuum Cleaners".

This standard has approved as Emirates (Technical Regulation) under UAE Cabinet Decree No. ( ), held on 00/00/2021.

## Labeling – Energy Efficiency Label for Electrical Appliances

## Part 9: Vacuum Cleaners

**1. Scope**

This standard applies to household electric mains-operated vacuum cleaners, including hybrid vacuum cleaners.

This standard does not apply to the following types:

- Water-only vacuum cleaners, dry and water-based vacuum cleaners, battery-only or self-powered vacuum cleaners (robot), industrial or central vacuums
- Floor polisher
- Vacuums intended for use outside the buildings (outdoor vacuum).

The purpose of this standard is to define the energy consumption of household vacuum cleaners and methods of measurement for them.

**2. Reference standards**

- UAE.S IEC 62885-2 1<sup>st</sup> ed. 2016 : Surface Cleaning Tools - Part 2: Vacuum cleaners for domestic use or similar use - Performance measurement methods.
- UAE.S IEC 60704-2-1 : Household and Similar Electrical Appliances - Test Code for Determination of Acoustic Noise Level - Part 1-2: Details of requirements for vacuum cleaners.

**3. Technical Terms and Definitions**

For the purposes of this document, the following terms and definitions apply.

## 1) Vacuum cleaner

Means an appliance that removes soil from a surface to be cleaned by means of an airflow created by under pressure developed within the unit;

## 2) Hybrid vacuum cleaner

Means a vacuum cleaner that can be powered by both electric mains and batteries;

## 3) Wet vacuum cleaner

means a vacuum cleaner that removes dry and/or wet material (soil) from the surface by applying water-based detergent or steam to the surface to be cleaned, and removing it, and the soil by an airflow created by under pressure developed within the unit, including types commonly known as spray-extraction vacuum cleaners;

## 4) Dry vacuum cleaner

Electrically operated appliance that removes dry material (e.g. dust, fibre, threads) from the surface to be cleaned by an airflow created by a vacuum developed within the unit, the removed material being separated in the appliance and the cleaned suction air being returned to the ambient air

## 5) Wet and dry vacuum cleaner

Means a vacuum cleaner designed to remove a volume of more than 2,5 litres, of liquid, in combination with the functionality of a dry vacuum cleaner;

6) Battery operated vacuum cleaner

Means a vacuum cleaner powered only by batteries;

7) Robot vacuum cleaner

Means a battery operated vacuum cleaner that is capable of operating without human intervention within a defined perimeter, consisting of a mobile part and a docking station and/or other accessories to assist its operation;

8) Industrial vacuum cleaner

Means a vacuum cleaner designed to be part of a production process, designed for removing hazardous material, designed for removing heavy dust from building, foundry, mining or food industry, part of an industrial machine or tool and/or a commercial vacuum cleaner with a head width exceeding 0,50 m;

9) Commercial vacuum cleaner

Means a vacuum cleaner for professional housekeeping purposes and intended to be used by laymen, cleaning staff or contracting cleaners in office, shop, hospital and hotel environments.

10) Central vacuum cleaner

Means a vacuum cleaner with a fixed (not movable) under pressure source location and the hose connections located at fixed positions in the building;

11) Floor polisher

Electrical appliance that is designed to protect, smoothen and/or render shiny certain types of floors, usually operated in combination with a polishing means to be rubbed on the floor by the appliance and commonly also equipped with the auxiliary functionality of a vacuum cleaner;

12) Outdoor vacuum

Appliance that is designed for use outdoors to collect debris such as grass clippings and leaves into a collector by means of an airflow created by under pressure developed within the unit and which may contain a shredding device and may also be able to perform as a blower;

13) General-purpose vacuum cleaner

Means a vacuum cleaner supplied with a fixed or at least one detachable nozzle designed for cleaning both carpets and hard floors, or supplied with both at least one detachable nozzle designed specifically for cleaning carpets and at least one detachable nozzle for cleaning hard floors;

14) Hard floor vacuum cleaner

Means a vacuum cleaner supplied with a fixed nozzle designed specifically for cleaning hard floors, or supplied solely with one or more detachable nozzles designed specifically for cleaning hard floors;

15) Carpet vacuum cleaner

Means a vacuum cleaner supplied with a fixed nozzle designed specifically for cleaning carpets, or supplied solely with one or more detachable nozzles designed specifically for cleaning carpets;

16) Cleaning cycle

Sequence of five double strokes to be carried out at a specified stroke speed over the test area according to the appropriate stroke pattern.

**4. General requirements:**

All vacuum cleaners covered by this standard must meet the following requirements:

**4.1 National (local) requirements:**

The following requirements must be met in the product covered by this standard:

Voltage : 220V - 240V

Frequency : 50Hz

**4.2 Electrical safety requirements:**

Vacuum cleaners falling within the scope of this standard must fulfill the requirements. Included in the UAE conformity assessment system (ECAS) for low voltage electrical appliances.

**4.3 Energy efficiency classification and cleaning performance:**

All vacuum cleaners when rated for energy efficiency must comply with the requirements set out below.

**4.3.1 Energy efficiency rating**

The energy efficiency of vacuum cleaners is classified in accordance with the annual energy consumption as shown in Table ( 1 ) .

**Table ( 1 ): Energy efficiency rating**

Stars rating	Annual energy consumption (AEc)	
	Phase 1 Until January 2024	Phase 2 From January 2024
most efficient 5	$AE \leq 28$	$AE \leq 16.0$
4	$28 < AE \leq 40.0$	$16.0 < AE \leq 28.0$
3	$40.0 < AE \leq 52.0$	$28.0 < AE \leq 40.0$
2	$52.0 < AE \leq 75.0$	$40.0 < AE \leq 60.0$
lowest efficient 1	$75.0 < AE \leq 100.0$	$60.0 < AE \leq 75.0$

In addition to energy efficiency requirements, the vacuum cleaners must fulfil the following requirements starting from Jan. 2024:

- Carpet dust suction (dpuc) should not be less than 0.75. This limit does not apply to hard floor vacuum cleaners.
- Dust extraction from hard floors (dpuhf) must be at least 0.99 and this limit does not apply to carpet vacuum cleaners.
- Dust emission ratio should not be more than 1.00%.
- The noise level should not be greater than or equal to 80dB (A).

The values mentioned in the above table are calculated according to the following items.

#### 4.3.2 Calculate annual energy consumption

Annual energy consumption (AE) is calculated per unit (kilowatt / year) and the value should be 1 decimal place (1 Decimal Place) as follows:

For carpet vacuum cleaners:

$$AEC = 4 * 87 * 50 * 0.001 * ASEc * \left( \frac{1 - 0.20}{dpuc - 0.20} \right)$$

For hard floor vacuum cleaners:

$$AEhf = 4 * 87 * 50 * 0.001 * ASEhf * \left( \frac{1 - 0.20}{dpuhf - 0.20} \right)$$

For vacuum cleaners for general cleaning purposes:

$$AEGp = (0.5 * AEC) + (0.5 * AEhf)$$

whereas :

ASEc: Average power consumption in watts (Wh / m<sup>2</sup>) during a carpet-cleaning test. ASEhf: Average power consumption in watts (Wh / m<sup>2</sup>) during a hard floor-cleaning test. Dpuc: dust extraction rate from carpet.

Dpuhf: dust extraction ratio from hard floors.

50: the base number for an hour of cleaning during the year.

87: The main surface to be cleaned in square meters (m<sup>2</sup>).

4: The main number that the vacuum passes over the place more than once (twice).

0.001: the conversion factor from Watts to Kilowatts.

1: Dust extraction ratio.

0.20 :the main difference between dust extraction after five cycles and after twice.

#### 4.3.2.1 Average Specific Energy Consumption (ASE)

The average specific energy consumption during the carpet cleaning test (ASEc) and during the hard floor cleaning test (ASEhf) is determined as the average energy consumption (SE) within the number of cleaning cycles which constitute the carpet and hard floor test respectively. The general equation of energy consumption (SE) with cleaning area test in watts / square meter with an accuracy equivalent to 3 decimal places (3 decimal places) applies to carpets, hard floors and general-use vacuum cleaners as follows:

$$SE = \frac{(P + NP) * t}{A}$$

whereas:

P: Average power in watts with an accuracy of 2 decimal places during cleaning time when the cleaning head is moved in the test area.

NP: Average power in watts with an accuracy of 2 decimal places with battery powered hoses, if found in the vacuum cleaner.

T: Total time in hours with an accuracy of 4 decimal places during the cleaning cycle and during the period when the cleaning head is in the center i.e. the point is between the side, front and back of the edges of the cleaning head and moves into the test area.

A: The cleaning surface is in square meters, with an accuracy of 2 decimal places and passes over the cleaning head during the cleaning period and is calculated on the basis of 10 times the product according to the width of the head and the appropriate length of the test area. If the width of the cleaning head is more than 0.320 m, then the figure 0.320 m will replace the width of the cleaning head in this equation.

In the hardwood floor test, the symbol (hf) and criteria (SEhf), (Phf), (NPhf), (thf) and (Ahf) are used in the above equation.

For carpet tests, criteria (T), (Sec), (Pc), (NPc), (tc) and (Ac) are used in the above equation. In all cleaning cycles the following values are (SEhf), (Phf), (NPhf), (thf), (Ahf), / or (Sec), (Pc), (NPc), (tc) and (Ac) as applied. Included in the technical documents.

#### 4.3.2.2 - Battery Powered Hose (NP)

The general equation for the average power of a battery powered hose NP (in watts) applies to carpet and hard floor cleaning brooms and general use brooms and includes the following equation:

$$NP = \frac{E}{tbat}$$



Where is:

E: Electricity consumption in watts with an accuracy of 3 decimal places in the battery-powered hoses in the vacuum cleaners necessary to fully recharge the battery to its original condition and fully charge after the cleaning cycle.

t<sub>bat</sub>: Total hourly time with an accuracy of 4 decimal places in a cleaning cycle in which battery-powered hoses are efficient and in compliance with manufacturer directions.

If the vacuum cleaner is not equipped with a battery powered hose, the NP value will be zero.

For hard floor testing, the criteria (hf), (NPhf), (Ehf) and (tbathf) are used in the above equation.

For carpet testing, (t), criteria (NPc), (Ec) and (tbatc) are used in the above equation. In all cleaning sessions the values (Ehf), (tbathf), / or (Ec) and (tbatc) are used as applicable and included in the technical documents.

#### 4.3.3. Dust extraction

Dust extraction from the hard floor (dpuhf) is determined as an average of the results in the two cleaning cycles of the hard floor test.

Carpet dust suction (dpuc) is set as an average of the results in the cleaning cycle of the carpet test. To correct the impartiality of the carpet test and calculate the percentage of dust extraction from the carpet (dpuc) as follows:

$$dpuc = dpum * \frac{dpu cal}{dpu ref}$$

dpum: dust extraction rate using a vacuum cleaner.

dpucal: the dust suction ratio of the dust suction measurement system by the vacuum cleaner when carrying out the carpet test was in the original state.

dpuref: dust extraction ratio in the vacuum cleaner measuring system.

Values (dpum) for each cleaning cycle (dpuc), (dpucal) and (dpuref) and include the technical documents.

#### 4.4 Dust emission

It determines the dust emission while the vacuum cleaner is running at full capacity and airflow.

#### 4.5 Noise level

Determines the noise level when cleaning carpets.

#### 4.6 Hybrid vacuum cleaners

For hybrid vacuum cleaners, all measurements are made on electric powered vacuum cleaners and any battery powered hose only.

### 5. Energy Efficiency Card:

All products in the market must have an energy efficient label according to the design shown in this standard.

The Energy Efficiency Label should place on the display product without exceptions. The energy efficiency label for non-display products could place or supply with the user manual.

All energy efficiency labels should print with the serial number assigned to the product.

### 6. Certificate of Conformity:

- The supplier must provide all the technical documents specified in Article (6).

- If the vacuum cleaner meets the technical requirements mentioned in this standard according to test reports, a Certificate of Conformity (CoC) is issued, valid for a period of (1) year from the date of issue with the ability to be renewed every year, in accordance with the UAE Conformity Assessment System (ECAS),

-A Certificate of Conformity (CoC) is issued valid for a period of (3) years from the date of issue with the possibility of renewal every (3) years, according to the Emirates Quality Mark (EQM),

### 7. Technical documents

The manufacturer or importers must provide technical documents, which must contain the following elements:

- a. Name and address of the supplier.
- b. A general description of the type of vacuum cleaner, model and / or trade symbol is sufficient to be easily recognized.
- c. Hard floor vacuums must be determined that they are not suitable for use in carpet cleaning using the hose supplied with them.
- d. In carpet vacuums, it must be determined that they are not suitable for use in cleaning hard floors using the hose supplied with them.
- e. Website address.
- f. The following technical values:
  - Energy consumption during carpet testing, if applicable.
  - Energy consumption during hard floor testing, if applicable.
  - Dust extraction rate from carpet and hard floors, if applicable.
  - Dust emission rate.
  - Noise level output.
  - The electrical energy used.

**8. Market evaluation and monitoring**

Market monitoring performance authorities should follow the following procedures when assessing conformity to the rating of vacuum cleaners in terms of energy efficiency:

- i. One model is tested. The model of the vacuum cleaner is considered to be in compliance with the requirements if the values in the technical documents and the test results comply with the requirements mentioned in this standard.
- ii. In the event that the results referred to in Clause (i) are not identical, then three additional units of the same model shall be selected for testing.
- iii. The model of the vacuum cleaner is considered to be in compliance with the requirements of this standard if the average result of the tests is for the specified model showing compliance with this standard.
- iv. In the event that the results referred to in clause (ii) are not achieved, then the model and all models similar to the model of the vacuum cleaner are considered inconsistent with this standard.

The values in the table, should be used only for product evaluation during market severance processes , not for conformity tests by companies.

requirement	The evaluation
Annual energy consumption	The specified value does not exceed 10% or greater than the declared value.
Dust extraction from carpet	The specified value shall not exceed 0.03% or less than the declared value.
Dust extraction from hard floors	The specified value is not more than 0.03% or less than the declared value.
Dust emission	The specified value is not more than 15% or greater than the declared value.
Noise level	The specified value does not exceed the declared value.

Specific value: It is the arithmetic mean of the specified values in the case of the three additional units tested