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COMMISSION REGULATION (EU) …/…

of XXX

laying down ecodesign requirements for vacuum cleaners pursuant to Directive 2009/125/EC of the European Parliament and of the Council, amending Commission Regulation (EC) No 1275/2008 and repealing Commission Regulation (EU) 666/2013

(Text with EEA relevance)

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COMMISSION REGULATION (EU)

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners

(Text with EEA relevance)

Article 1
Subject matter and scope

1. This Regulation establishes ecodesign requirements for the placing on the market of mains-operated and cordless vacuum cleaners, including hybrid vacuum cleaners.

2. This Regulation shall not apply to:

   (a) wet, wet and dry, industrial, or central vacuum cleaners;

   (b) floor polishers;

   (c) robot vacuum cleaners;

   (d) outdoor vacuums;

   (e) handheld vacuum cleaners.

Article 2
Definitions

For the purpose of this Regulation the following definitions shall apply:

(1) '*mains*' or '*electric mains'* means the electricity supply from the grid of 230 (±10 %) volt of alternating current at 50 Hz;

(2) '*vacuum cleaner*' means an appliance that removes soil from a surface to be cleaned by means of an airflow created by underpressure developed within the unit;

(3) '*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;

(4) '*hybrid vacuum cleaner*' means a vacuum cleaner that can be powered by both electric mains and batteries;

(5) '*commercial vacuum cleaner'* means a mains-operated vacuum cleaner for professional housekeeping purposes and used by laymen, cleaning staff or contracting cleaners in office, shop, hospital and hotel environments, declared by the manufacturer as such in the Declaration of Conformity pertaining to Directive 2006/42/EC of the European Parliament and of the Council[1];

(6) '*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 underpressure

[1] OJ L 157, 9.6.2006, p. 24.

developed within the unit, including types commonly known as sprayextraction vacuum cleaners;

(7) '*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;

(8) '*dry vacuum cleaner*' means a vacuum cleaner designed to remove soil that is principally dry (dust, fibre, threads), including types equipped with a battery operated active nozzle;

(9) '*cordless vacuum cleaner*' means a vacuum cleaner powered only by batteries, other than a handheld vacuum cleaner;

(10) '*handheld vacuum cleaner*' means a lightweight cordless vacuum cleaner with cleaning head, dirt storage and vacuum generator integrated in a compact housing, allowing the cleaner to held and operated whilst being held in one hand;

(11) '*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;

(12) '*central vacuum cleaner*' means a vacuum cleaner with a fixed (not movable) underpressure source location and the hose connections located at fixed positions in the building;

(13) '*floor polisher*' means an electrical appliance that protects, smoothes and/or renders 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;

(14) '*outdoor vacuum*' means an appliance that is used outdoors to collect debris such as grass clippings and leaves into a collector by means of an airflow created by underpressure developed within the unit and which may contain a shredding device and may also be able to perform as a blower;

(15) *'equivalent model'* means a model which has the same technical characteristics relevant for the technical information to be provided, but which is placed on the market or put into service by the same manufacturer, importer or authorised representative as another model with a different model identifier;

(16) *'model identifier'* means the code, usually alphanumeric, which distinguishes a specific product model from other models with the same trade mark or the same manufacturer's, importer's or authorised representative's name;

(17) '*product database'* means a collection of data concerning products, which is arranged in a systematic manner and consists of a consumer-oriented public part, where information concerning individual product parameters is accessible by electronic means, an online portal for accessibility and a compliance part, with clearly specified accessibility and security requirements, as laid down in Regulation (EU) 2017/1369[2];

(18) *'end-user'* means a consumer buying or expected to buy a vacuum cleaner.

[2] Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU (OJ L 198, 28.7.2017, p. 1–23)

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For the purposes of the Annexes, additional definitions are set out in Annex I.

Article 3
Ecodesign requirements

The ecodesign requirements set out in Annex II shall apply from the dates indicated therein.

Article 4
Conformity assessment

1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain the declared values of the parameters listed in Annex II, points 2, 3 and 4, and the details and the results of the calculations undertaken in accordance with in Annex III.

3. Where the information included in the technical documentation for a particular vacuum cleaner model has been obtained:

   (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer, or

   (b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer, or both.

   The technical documentation shall include the details of such calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers.

4. The technical documentation shall include the information in the order and as set out in Annex VI of Regulation (EU) 2020/XXX [OP - Please insert here references of the energy labelling regulation on vacuum cleaners]. For market surveillance purposes, manufacturers, importers or authorised representatives may, without prejudice to point 2(g) of Annex IV to Directive 2009/125/EC, refer to the technical documentation uploaded to the product database which contains the same information laid down in Regulation (EU) 2020/XXX [OP - Please insert here references of the energy labelling regulation on vacuum cleaners].

Article 5
Verification procedure for market surveillance purposes

Member States shall apply the verification procedure described in Annex IV when performing the market surveillance checks referred to in Article 3, point 2 of Directive 2009/125/EC.

Article 6
Circumvention

The manufacturer, importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering their performance

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during the test with the aim of reaching a more favourable level for any of the parameters declared by the manufacturer, importer or authorised representative in the technical documentation or included in any documentation provided.

The consumption of energy of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with the explicit consent of the end-user prior to the update. No performance change shall occur as a result of rejecting the update.

Article 7
Indicative benchmarks

The indicative benchmarks for best-performing products and technologies available on the market at the time of adopting this Regulation are set out in Annex V.

Article 8
Review

The Commission shall review this Regulation in the light of technological progress and present the result of that review, including, if appropriate, a draft revision proposal, to the Consultation Forum by *[OP – please insert date - 6 years after its entry into force]*.

The review shall in particular assess the following:

- the appropriateness of including robot vacuum cleaners in scope;
- the appropriateness of setting additional resource efficiency requirements for products in accordance with the principles of the circular economy;
- the appropriateness of introducing an Energy Index (EI) in line with that for commercial vacuum cleaners for all types of vacuum cleaners included in the scope.

Article 9
Amendment to Regulation (EU) No 1275/2008

In point 1 of Annex I to Regulation (EC) No 1275/2008 is replaced by the following:

– the entry 'Other appliances for cooking and other processing of food, cleaning, and maintenance of clothes' is replaced by 'Other appliances for cooking and other processing of food, cleaning, and maintenance of clothes with the exception of vacuum cleaners covered by Commission Regulation (EU) [*OP – please insert here the number of this Regulation*]'.

Article 10
Repeal

Commission Regulation (EC) No 666/2013 shall be repealed with effect from 28 February 2023.

Article 11
Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

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It shall apply from 1 March 2023. However, Article 6, first paragraph shall apply from *[OP – please insert the day of entry into force of this Regulation]*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission

The President

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ANNEX I

Definitions applicable for the annexes

The following definitions shall apply:

(19) '*battery operated active nozzle*' means a cleaning head provided with an agitation device powered by batteries to assist dirt removal;

(20) '*water filter vacuum cleaner*' means a mains-operated dry vacuum cleaner that uses more than 0,5 litre of water as the main filter medium, whereby the suction air is forced through the water entrapping the removed dry material as it passes through;

(21) '*household vacuum cleaner*' means a mains operated vacuum cleaner for household use, declared by the manufacturer as such in the Declaration of Conformity pertaining to Directive 2006/95/EC of the European Parliament and of the Council[3];

(22) '*general purpose vacuum cleaner*' means a household or commercial mains-operated vacuum cleaner or a cordless 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;

(23) '*hard floor vacuum cleaner*' means a household or commercial mains-operated vacuum cleaner or a cordless 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;

(24) '*carpet vacuum cleaner*' means a household or commercial mains-operated vacuum cleaner or a cordless 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;

(25) '*hard floor crevice test*' means a test of an appropriate number of cleaning cycles where the cleaning head of a vacuum cleaner operating at maximum suction setting passes over a wooden test plate test area with width equal to the cleaning head width and appropriate length, featuring a diagonally (45°) placed test crevice, where the time elapsed, electric power consumption and the relative position of the centre of the cleaning head to the test area are continuously measured and recorded at an appropriate sample rate and where at the end of each cleaning cycle the mass decrease of the test crevice is appropriately assessed;

(26) '*test crevice*' means a removable U-shaped insert with appropriate dimensions filled at the beginning of a cleaning cycle with appropriate artificial dust;

(27) '*carpet test*' means a test with an appropriate number of cleaning cycles on an appropriate carpet test rig where the cleaning head of a vacuum cleaner operating at maximum suction setting passes over the test area with width equal to the cleaning head width and appropriate length, soiled with equally distributed and appropriately embedded test dust of appropriate composition, where the time elapsed, electric power consumption and the relative position of the centre of the cleaning head to the

[3] OJ L 157, 9.6.2006, p.24.

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test area are continuously measured and recorded at an appropriate sample rate and at the end of each cleaning cycle the mass increase of the appliance dust receptacle is appropriately assessed;

(28) '*hard floor debris test*' means a test of an appropriate number of cleaning cycles where the cleaning head of a vacuum cleaner operating at maximum suction setting passes over a wooden test plate test area with debris laid out in an appropriate manner, where the time elapsed, electric power consumption and the relative position of the centre of the cleaning head to the test area are continuously measured and recorded at an appropriate sample rate and where at the end of each cleaning cycle the number of debris pieces picked up is appropriately assessed;

(29) '*carpet debris test*' means a test with an appropriate number of cleaning cycles on an appropriate carpet test rig where the cleaning head of a vacuum cleaner operating at maximum suction setting passes over the test area with debris laid out in an appropriate manner, where the time elapsed, electric power consumption and the relative position of the centre of the cleaning head to the test area are continuously measured and recorded at an appropriate sample rate and at the end of each cleaning cycle number of debris pieces picked up is appropriately assessed;

(30) '*debris*' means a standard type of smaller items to be picked up from the test floor in order to illustrate the removal of larger pieces of dirt from floors;

(31) '*cleaning head width'* in m, at an accuracy of 3 decimal places, means the external maximum width of the cleaning head;

(32) *'beat and brush nozzle'* means an active nozzle with moving belts and/or brushes used for cleaning carpets that imparts physical force upon the carpet to ensure better dust removal;

(33) *'cleaning cycle'* means a sequence of an appropriate number of double strokes of the vacuum cleaner on a floor-specific test area ('carpet' or 'hard floor');

(34) '*double stroke'* means one forward and one backward movement of the cleaning head in a parallel pattern, performed at a uniform test stroke speed and with a specified test stroke length;

(35) *'test stroke speed'* in m/h means the appropriate cleaning head speed for testing. Products with self-propelled cleaning heads shall come as close as possible to the appropriate speed, but a deviation is permitted when clearly stated in the technical documentation;

(36) *'test stroke length'* in m means the length of the test area plus the cleaning head distance covered by the centre of the cleaning head when moving over the appropriate acceleration zones before and after the test area;

(37) *'dust pick up'* (dpu), at an accuracy of 3 decimal places, means the ratio of the mass of the artificial dust removed, determined for carpet through the mass increase of the appliance dust receptacle and for hard floor through the mass decrease of the test crevice, after a number of double strokes of the cleaning head, to the mass of artificial dust initially applied to a test area, for carpet corrected for the specific test conditions and for hard floor corrected for the length and positioning of the test crevice;

(38) *'reference vacuum cleaner system'* means electrically operated laboratory equipment used to measure the calibrated and reference dust pick-up on carpets with given air related parameters to improve the reproducibility of test results;

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(39) *'maximum operating power'* in W means the power level that the machine is not capable of exceeding in any operating condition set either by the user or automatically by the appliance;

(40) *'dust re-emission'* means the ratio, expressed as a percentage at an accuracy of 2 decimal places, of the number of all dust particles of a size from 0.3 to 10 μm emitted by a vacuum cleaner to the number of all dust particles of the same size range entering the suction inlet when fed with a specific amount of dust of that particle size range. The value includes not only dust measured at the vacuum cleaner outlet but also dust emitted elsewhere either from leaks, or generated by the vacuum cleaner;

(41) *'sound power level'* means airborne acoustical noise emissions, expressed in dB(A) re 1 pW and rounded to the nearest integer;

(42) *'decrease in air flow with loading'* means the relative decrease of airflow of a vacuum cleaner with (partly) loaded receptacle, measured in L/sec to XX decimal places, compared to the airflow of the same vacuum cleaner with an empty receptacle;

(43) *'motion resistance'* means the push/pull forces in N measured to XX decimal places when moving the cleaning head over the test carpet while measuring dust pick up on carpet;

(44) *'battery lifetime'* means the number of cycles the battery can withstand as a minimum while maintaining a defined share of the original capacity;

(45) *'maintenance mode'* means the mode of a cordless vacuum cleaner, when it is connected to the charging station / docking station and is no longer charging;

(46) '*standby mode(s)*' means a condition where the equipment is connected to the mains power source, depends on energy input from the mains power source to work as intended and provides only the following functions, which may persist for an indefinite time:

(a) reactivation function, or reactivation function and only an indication of enabled reactivation function;

(b) and/or information or status display;

(47) '*reactivation function'* means a function facilitating the activation of other modes, including active mode, by remote switch, including remote control, internal sensor, timer to a condition providing additional functions, including the main function(s);

(48) '*network*' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols);

(49) '*networked standby'* means a condition in which the equipment is able to resume a function by way of a remotely initiated trigger from a network connection;

(50) *'commercial guarantee'* means any undertaking by the trader or a producer (the guarantor) to the consumer, in addition to any legal obligation relating to the guarantee of conformity, to:

(a) reimburse the price paid; or

(b) replace, repair or service goods in any way if they do not meet the specifications or any other requirements not related to conformity set out in the

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guarantee statement or in the relevant advertising available at the time of, or before, the conclusion of the contract.

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ANNEX II

Ecodesign requirements

1. ENERGY REQUIREMENTS

From 1 March 2023 vacuum cleaners shall meet following requirements:

(1) The annual energy consumption calculated in accordance with point 1 of Annex III shall be less than or equal to 43,0 kWh/year.

(2) For commercial vacuum cleaners the energy index calculated in accordance with point 2 of Annex III shall be above or equal to 0,53m^2/min.

(3) The maximum operating power shall be less than or equal to 900 W.

2. FUNCTIONAL REQUIREMENTS

From 1 March 2023 vacuum cleaners shall meet the following requirements:

(1) dust pick up on carpet (dpu_c) for household and commercial vacuum cleaners shall be greater than or equal to 0,75. This limit shall not apply to hard floor vacuum cleaners,

(2) dust pick up on hard floor (dpu_{hf}) for household and commercial vacuum cleaners shall be greater than or equal to 0,98. This limit shall not apply to carpet vacuum cleaners,

(3) debris pick up on carpet for household vacuum cleaners and for cordless vacuum cleaners shall be greater than or equal to 0,70,

(4) debris pick up on hard floor for household vacuum cleaners and for cordless vacuum cleaners shall be greater than or equal to 0,75,

(5) debris pick up on hard floor for commercial vacuum cleaners shall be greater than or equal to 60%,

(6) dust re-emission shall be no more than or equal to 0,8% for household and commercial vacuum cleaners and no more than or equal to 3% for cordless vacuum cleaners,

(7) sound power level for household and commercial vacuum cleaners shall be less than or equal to 78 dB(A) or 80 dB(A) if the product is equipped with a beat and brush nozzle and less than or equal to 85 dB(A) for cordless vacuum cleaners,

(8) motion resistance shall be no more than 40 N,

(9) operational motor lifetime for household and commercial vacuum cleaners shall be greater than or equal to 550 hours with an empty receptacle,

(10) the hose, if any, shall be durable so that it is still useable after 40 000 oscillations under strain,

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(11) battery lifetime for cordless vacuum cleaners shall be at least 600 cycles while maintaining 70% capacity.

These limits shall not apply to water filter vacuum cleaners.

The dpu_c (dust pick up on carpet), dpu_{hf} (dust pick up on hard floor), debris pick-up on carpet, debris pick-up on hard floor, dust re-emission, decrease in air flow with loading, motion resistance, maintenance power sound power level, durability of the hose, operational motor lifetime and battery lifetime are measured and calculated in accordance with Annex III.

3. LOW POWER MODES REQUIREMENTS

From 1 March 2023 cordless vacuum cleaners shall meet the following requirements:

(1) Cordless vacuum cleaners shall have one or more of the following modes: an off-mode or a standby mode or a maintenance mode. The power consumption of these modes shall not exceed 0,50 W;

(2) If the standby and/or the maintenance mode includes the display of information or status, the power consumption of this mode shall not exceed 1,00 W;

(3) If the standby and/or the maintenance mode provides for a connection to a network and provides networked standby as defined in Commission Regulation (EC) No 1275/2008[4], the power consumption of this mode shall not exceed 2,00 W;

(4) Any vacuum cleaner that can be connected to a network shall provide the possibility to activate and deactivate the network connection(s). The network connection(s) shall be deactivated by default.

4. RESOURCE EFFICIENCY REQUIREMENTS

From 1 March 2023, vacuum cleaners shall meet the following requirements:

(1) Availability of spare parts.

(a) Manufacturers, importers or authorised representatives of vacuum cleaners shall make available to professional repairers at least the following spare parts for a minimum period of:

- 8 years for household vacuum cleaners;
- 5 years for commercial vacuum cleaners;
- 6 years for cordless vacuum cleaners ;

after placing the last unit of the model on the market.

- For household and commercial vacuum cleaners: hose, power cord roll-up, filters, handle, nozzles and tube extensions;
- For cordless vacuum cleaners: battery, hose, filters, handle, nozzles and tube extensions.

[4] Commission Regulation (EU) No 801/2013 of 22 August 2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions Text with EEA relevance, OJ L 225, 23.8.2013, p. 1–12

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(b) Manufacturers, importers or authorised representatives of vacuum cleaners shall ensure that the spare parts mentioned in point (a) can be replaced with the use of commonly available tools and without permanent damage to the vacuum cleaner.

(c) The list of spare parts in point (a) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at the latest two years after the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts.

(d) manufacturers, importers or authorised representatives of vacuum cleaners shall make available to professional repairers and end-users at least the following spare parts:

(i) for household vacuum cleaners, nozzles, filters and tube extensions, for a minimum period of eight years after placing the last unit of the model on the market;

(ii) for commercial vacuum cleaners, nozzles, filters and tube extensions, for a minimum period of five years after placing the last unit of the model on the market;

(iii) for cordless vacuum cleaners, nozzles, batteries, filters and tube extensions, for a minimum period of six years after placing the last unit of the model on the market.

(2) Maximum delivery time of spare parts

During the periods mentioned under point (1), the manufacturer, importer or authorised representative shall ensure the delivery of the spare parts within 15 working days after having received the order.

In the case of spare parts concerned by point (1)(a), the availability of spare parts may be limited to professional repairers registered in accordance with point (3)(a) and (b).

In the case of spare parts concerned by point (1)(d), the procedure for ordering them and the repair instructions shall be publicly available on the manufacturer's, the importer's or authorised representative's free access website, at the moment of the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts.

(3) Access to Repair and Maintenance Information

After a period of two years after the placing on the market of the first unit of a model and until the end of the period mentioned under point (1), the manufacturer, importer or authorised representative shall provide access to the vacuum cleaner's repair and maintenance information to professional repairers in the following conditions:

(a) the manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or

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authorised representatives may require the professional repairer to demonstrate that

(i) the professional repairer has the technical competence to repair vacuum cleaners and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;

(ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State.

(b) The manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request;

(c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information;

(d) Once registered, a professional repairer shall have access, within one working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant;

(e) The vacuum cleaner's repair and maintenance information shall include:

- the unequivocal vacuum cleaner identification;
- a disassembly map or exploded view;
- technical manual of instructions for repair;
- list of necessary repair and test equipment;
- component and diagnosis information (such as minimum and maximum theoretical values for measurements);
- wiring and connection diagrams;
- diagnostic fault and error codes (including manufacturer-specific codes, where applicable);
- instructions for installation of relevant software and firmware including reset software; and
- information on how to access data records of reported failure incidents stored on the vacuum cleaner (where applicable).

(4) Requirements for dismantling for material recovery and recycling while avoiding pollution.

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Manufacturers, importers or authorised representatives shall ensure that vacuum cleaners are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU[5] can be removed with the use of commonly available tools.

Manufacturers, importers or authorised representatives shall fulfil the obligations laid down in Point 1 of Article 15 of Directive 2012/19/EU.

5. INFORMATION REQUIREMENTS

From 1 March 2023 vacuum cleaners shall meet the following requirements.

User instructions shall be provided in the form of a user manual on a free access website of the manufacturer, importer or authorised representative, and shall include:

(1) the following general information:

(a) for hard floor vacuum cleaners, mention that they are not suitable for use on carpets with the nozzle supplied;

(b) for carpet vacuum cleaners, mention that they are not suitable for use on hard floors with the nozzle supplied;

(c) for appliances that are enabled to function also for other purposes than vacuum cleaning, the electric input power relevant to vacuum cleaning if this is lower than the rated input power of the appliance;

(d) as to which of the following three groups the vacuum cleaner should be tested: general purpose vacuum cleaner, hard floor vacuum cleaner or carpet vacuum cleaner;

(e) information on how to activate and deactivate the network connection (if applicable) and impact on energy consumption;

(f) instructions on how to find the model information stored in the product database, as defined in Commission Delegated Regulation (EU) [OP -Please insert regulation number energy labelling regulation for vacuum cleaners] by means of a weblink that links to the model information as stored in the product database or a link to the product database and information on how to find the model identifier on the product.

(2) values for the following parameters:

(a) for household and cordless vacuum cleaners, the annual energy consumption in kWh/year;

(b) maximum operating power in W;

(c) dust pick up on hard floor and carpet;

(d) sound power level in dB(A);

(e) dust re-emission; and

(f) for commercial vacuum cleaners, the Energy Index in m^2/min.

[5] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), OJ L 197, 24.7.2012, p. 38.

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(3) The user instructions shall also include instructions for the user to perform maintenance operations. Such instructions shall as a minimum include instructions for:

(a) correct installation including connection to mains;

(b) cleaning of filters, including optimal frequency, procedure and main consequences of insufficient cleaning of filters;

(c) how to ensure long battery life and how to replace batteries;

(d) emptying of receptacles and replacement of bags if relevant;

(e) identification of errors, the meaning of the errors, and the action required, including identification of errors requiring professional assistance;

(f) how to access professional repair (internet webpages, addresses, contact details);

Such instructions shall also include information on:

(g) any implications of self-repair or non-professional repair for the safety of the end-user and for the commercial guarantee;

(h) the minimum period during which the spare parts for the vacuum cleaner are available.

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ANNEX III

Measurement and calculation methods

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

The hard floor crevice test and debris test and the carpet dust and debris tests shall be used for the measurement and calculation of the Annual Energy Consumption, the Energy Index and the cleaning performance. The specific energy consumption, the cleaning performance and the dust re-emission shall be measured concurrently.

For hybrid vacuum cleaners all measurements shall be made with the vacuum cleaner powered by the electric mains and any battery operated active nozzle only.

1. **ANNUAL ENERGY CONSUMPTION**

5. The annual energy consumption *AE* is calculated, in kWh/year and rounded to one decimal place, as follows for household vacuum cleaners:

6. for carpet vacuum cleaners:

$$AE_c = 4 \times 87 \times 50 \times 0{,}001 \times ASE_c \times \left(\frac{dpu_c, BASECASE}{dpu_c}\right)$$

for hard floor vacuum cleaners:

$$AE_{hf} = 4 \times 87 \times 50 \times 0{,}001 \times ASE_{hf} \times \left(\frac{deb_{hf}, BASECASE}{deb_{hf}}\right)$$

for general-purpose vacuum cleaners:

7. $$AE_{gp} = 0{,}5 \times AE_c + 0{,}5 \times AE_{hf}$$

8. where:

– ASE_c is the average specific energy consumption in Wh/m^2 during carpet test, calculated as provided below;

– ASE_{hf} is the average specific energy consumption in Wh/m^2 during hard floor test, calculated as provided below;

– dpu_c is the dust pick-up on carpet, determined in accordance with point 3 of this Annex ;

– $dpu_{c,BASECASE}$ is the basecase dust pick-up on carpet with a value of 0,8;

– $dpeb_{hf}$ is the debris pick-up on hard floor, determined in accordance with point 4 of this Annex

– $deb_{hf,BASECASE}$ is the basecase debris pick-up on hard floor with a value of 0,85;

– 50 is the standard number of one-hour cleaning tasks per year

– 87 is the standard dwelling surface to be cleaned in m^2

– 4 is the standard number of times that a vacuum cleaner passes over each point on the floor (two double strokes)

– 0,001 is the conversion factor from Wh to kWh

For hard floor cordless vacuum cleaners:

$$AE_{hf} = 4 \times \left(\frac{87}{4}\right) \times 200 \times 0{,}001 \times ASE \times \left(\frac{deb_{hf}, BASECASE}{deb_{hf}}\right) + \frac{M_h \times 8026}{1000}$$

For carpet cordless vacuum cleaners:

$$AE_c = 4 \times \left(\frac{87}{4}\right) \times 200 \times 0{,}001 \times ASE \times \left(\frac{dpu_c, BASECASE}{dpu_c}\right) + \frac{M_h \times 8026}{1000}$$

For general-purpose cordless vacuum cleaners:

9. $AE_{gp} = 0{,}5 \times AE_c + 0{,}5 \times AE_{hf}$

where:

- M_h is the power consumption in maintenance mode in W
- 8026 is the annual number of hours spent in maintenance mode

1.1. Average specific energy consumption (ASE) for mains operated household vacuum cleaners

The average specific energy consumption during carpet test (ASE_c) and during hard floor test (ASE_{hf}) shall be determined as an average of the specific energy consumption (*SE*) of the number of cleaning cycles that constitute the carpet and hard floor test, respectively. The general equation for the specific energy consumption SE in Wh/m^2 test area, at an accuracy of 3 decimal places, applicable for carpet, hard floor and general purpose vacuum cleaners with the appropriate suffixes, is:

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

where:

– *P* is the average power in W, at an accuracy of 2 decimal places, during the time in a cleaning cycle that the centre of the cleaning head is moving over the test area

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– *NP* is the average power equivalent in W, at an accuracy of 2 decimal places, of battery operated active nozzles, if any, of the vacuum cleaner, calculated as provided below

– *t* is the total time in hours, at an accuracy of 4 decimal places, in a cleaning cycle during which the centre of the cleaning head, i.e. a point halfway between the side, front and back edges of the cleaning head, is moving over the test area

– *A* is the surface area in m^2, at an accuracy of 3 decimal places, passed over by the cleaning head in a cleaning cycle, calculated as twice the number of double strokes times the product of the head width and the appropriate length of test area.

For the hard floor tests the suffix *hf* and parameter names SE_{hf}, P_{hf}, NP_{hf}, t_{hf} and A_{hf} shall be used in the above equation. For the carpet tests the suffix *c* and parameter names SE_c, P_c, NP_c, t_c and A_c shall be used in the above equation. For each of the cleaning cycles, values of SE_{hf}, Ph_f, NP_{hf}, t_{hf}, A_{hf} and/or SE_c, P_c, NP_c, t_c, A_c, as applicable, shall be included in the technical documentation.

1.2. Average specific energy consumption (ASE) for cordless vacuum cleaners

The average specific energy consumption during carpet test (ASE_c) and during hard floor test (ASE_{hf}) shall be determined as an average of the specific energy consumption (*SE*) of the number of cleaning cycles that constitute the carpet and hard floor test, respectively. The general equation for the specific energy consumption SE in Wh/m^2 test area, at an accuracy of 3 decimal places, applicable for carpet, hard floor and general purpose cordless vacuum cleaners with the appropriate suffixes, is:

$$SE = \frac{E_{charge}}{A}$$

where:

– E_{charge} is the electricity consumption in Wh at an accuracy of 3 decimal places of the cordless vacuum cleaner necessary to return the initially fully charged battery to its originally fully charged state after a cleaning cycle;

– *A* is the surface area in m^2, at an accuracy of 3 decimal places, passed over by the cleaning head in a cleaning cycle, calculated as 10 times the product of the head width and the appropriate length of test area. If a household vacuum cleaner has a head width of over 0,320 m, then the figure of 0,320 m shall be substituted for head width in this calculation.

For the hard floor tests the suffix *hf* and parameter names SE_{hf}, $E_{charge,hf}$ and A_{hf} shall be used in the above equation. For the carpet tests the suffix *c* and parameter names SE_c, $E_{charge,c}$ and A_c shall be used in the above equation. For each of the cleaning cycles, values of SE_{hf}, $E_{charge,hf}$, A_{hf} and/or SE_c, $E_{charge,c}$, A_c, as applicable, shall be included in the technical documentation.

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1.3. Power equivalent of battery operated active nozzles (NP)

The general equation for the average power equivalent of battery operated active nozzles NP in W, applicable for carpet, hard floor and general purpose vacuum cleaners with the appropriate suffixes, is:

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

where:

– *E* is the electricity consumption in Wh at an accuracy of 3 decimal places of the battery operated active nozzle of the vacuum cleaner necessary to return the initially fully charged battery to its originally fully charged state after a cleaning cycle;

– *tbat* is the total time in hours, at an accuracy of 4 decimal places, in a cleaning cycle in which the battery operated active nozzle of the vacuum cleaner is activated, in accordance with manufacturer's instructions;

In case the vacuum cleaner is not equipped with battery operated active nozzles the value of NP equals zero.

For the hard floor tests the suffix *hf* and parameter names NP_{hf}, E_{hf}, $tbat_{hf}$ shall be used in the above equation. For the carpet tests the suffix *c* and parameter names NP_c, E_c, $tbat_c$ shall be used in the above equation. For each of the cleaning cycles, values of E_{hf}, $tbat_{hf}$ and/or E_c, $tbat_c$, as applicable, shall be included in the technical documentation.

2. ENERGY INDEX FOR COMMERCIAL VACUUM CLEANERS

10. The Energy Index *EI* is calculated, in m^2/min and rounded to one decimal place, as follows for commercial vacuum cleaners:

$$EI_{total} = \left(P_{area} \times C_{Q,total}\right) \times \left(C_{power,total}\right)$$

where:

$$P_{area} = K_1 \times \frac{w_{nozzle}[m] \times v_{stroke}\left[\frac{m}{min}\right]}{n_{ss}}$$

where:

- P_{area} is the surface cleaning performance (m^2 /min)
- K_1 is a weighting factor with the value 1,00
- W_{nozzle} is the nozzle width
- v_{stroke} is the velocity of the nozzle over the floor
- 'n_{ss}' is the number of times the nozzle travels at constant speed over the surface during cleaning, with default value 4.

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$$C_{Q,total} = K_4 \times \left(\frac{dpu_C}{dpu_{C,BAT}} + \frac{dpu_{hf} + K_5 \times deb_{hf}}{dpu_{hf,BAT} + deb_{hf,BAT}} \right)$$

where:

- $C_{(Q,total)}$ is the cleaning performance factor
- K_4 is a weighting factor with the value 0,30
- K_5 is a weighting factor with the value 1,00
- dpu_c is the dust pick up on carpet measured in accordance with point 3 of this Annex
- dpu_{hf} is the dust pick up on hard floor measured in accordance with point 3 of this Annex
- deb_{hf} is the debris pick up on hard floor measured in accordance with point 4 of this Annex III
- $dpu_{c,BAT}$ is the BAT dust pick up on carpet with a value of 0,95.
- $dpu_{hf,BAT}$ is the BAT dust pick up on hard floor with a value of 1,15
- $deb_{hf,BAT}$ is the BAT debris pick up on carpet with a value of 1,00

$$C_{power,total} = K_2 \times \left(\frac{power_{C,BAT}}{power_C} + \frac{power_{hf,BAT}}{power_{hf}} \right)$$

where

- $C_{(power)}$ is the power factor
- K_2 is a weighting factor with the value 1,00
- $power_c$ is the measured input power during the carpet dust pick-up test cycles
- $power_{hf}$ is the measured input power during the hard floor dust pick-up test cycles
- $power_{c,BAT}$ is the base case input power on carpet with a value of 200 W
- $power_{hf,BAT}$ is the base case input power on hard floor with a value of 250 W

3. DUST PICK-UP

The dust pick-up on hard floor (dpu_{hf}) shall be the determined as the average of the results of the two cleaning cycles in a hard floor crevice test.

The dust pick-up on carpet (dpu_c) shall be the determined as the average of the results of the cleaning cycles in a carpet test. To correct for deviations from a test carpet's original properties, the dust pick-up on carpet (dpu_c) shall be the calculated as follows:

$$dpu_c = dpu_m \times \left(\frac{dpu_{cal}}{dpu_{ref}} \right)$$

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where:

– dpu_m is the measured dust pick-up of the vacuum cleaner;

– dpu_{cal} is the dust pick-up of the reference vacuum cleaner system measured when the test carpet was in original condition;

– dpu_{ref} is the measured dust pick-up of the reference vacuum cleaner system.

Values of dpu_m for each of the cleaning cycles, dpu_c, dpu_{cal} and dpu_{ref} shall be included in the technical documentation.

4. DEBRIS PICK-UP

The debris pick-up on hard floor (deb_{hf}) shall be the determined as the average of the results of the two cleaning cycles in a hard floor debris test. The debris pick-up on hard floor shall be measured with the same nozzle, nozzle settings and vacuum cleaner settings as used in the measurement of dust pick-up on hard floor.

The debris pick-up on carpet (deb_c) shall be the determined as the average of the results of the two cleaning cycles in a carpet debris test. The debris pick-up on carpet shall be measured with the same nozzle, nozzle settings and vacuum cleaner settings as used in the measurement of dust pick-up on carpet

5. DUST RE-EMISSION

The dust re-emission shall be determined while the vacuum cleaner is operating at its maximum air flow.

6. SOUND POWER LEVEL

Sound power level shall be determined on carpet.

7. MOTION RESISTANCE

The motion resistance shall be the determined as the average of the results of the cleaning cycles in a carpet test. The motion resistance shall be measured on the same carpet and with the same nozzle, nozzle setting and vacuum cleaner settings as when measuring the dust pick-up on carpet.

8. MAINTENANCE POWER

The maintenance power for cordless vacuum cleaners measured when in the maintenance mode shall be measured as an average over a 24-hour period where the vacuum cleaner is connected to the charging device. The measurement shall begin once the battery has reached a fully charged level in the moment where the measurement of power consumed for cleaning stops. The result shall be the average power consumption during the 24-hour period including any peaks caused by software updates, sensor activation or other functions.

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9. DURABILITY OF THE HOSE

The test of durability of the hose shall be performed with state-of-the-art test and calculation methods that are reliable, accurate and reproducible, including harmonised standards the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

10. OPERATIONAL MOTOR LIFE-TIME

The test of operational motor lifetime shall be performed with state-of-the-art test and calculation methods that are reliable, accurate and reproducible, including harmonised standards the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

11. BATTERY LIFETIME

The battery lifetime of cordless vacuum cleaners shall be measured by charging and discharging the battery at least 600 times, to a depth of discharge (DoD) of 90% and a state of charge (SoC) of 100%.

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ANNEX IV

Verification procedure for market surveillance purposes

11. The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the manufacturer or importer as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

    Where a model has been designed to be able to detect it is being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering its performance during the test with the objective of reaching a more favourable level for any of the parameters specified in this Regulation or included in the technical documentation or included in any of the documentation provided, the model and all equivalent models shall be considered not compliant.

12. When verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

    (1) The Member State authorities shall verify one single unit of the model.

    (2) The model shall be considered to comply with the applicable requirements if:

        (a) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer or importer than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and

        (b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer or importer does not contain values that are more favourable for the manufacturer or importer than the declared values; and

        (c) when the Member State authorities check the unit of the model, they find that the manufacturer, importer or authorised representative has put in place a system that complies with the requirements in the second paragraph of Article 6; and

        (d) when the Member State authorities check the unit of the model, it complies with the energy requirements points 1, functional requirements in point 2, low power mode requirements in point 3, resource efficiency requirements in point 4 and information requirements in point 5 of Annex II; and

        (e) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 1.

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(3) If the results referred to in point 2(a) or (b) are not achieved, the model and all models shall be considered not to comply with this Regulation.

(4) If the result referred to in point 2(c) is not achieved, the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more equivalent models.

(5) The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 1.

(6) If the result referred to in point 5 is not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

(7) The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points (3) and (6).

13. The Member State authorities shall use the measurement and calculation methods set out in Annex III.

14. The Member State authorities shall only apply the verification tolerances that are set out in Table 1 and shall only use the procedure described in points 1 to 7 for the requirements referred to in this Annex. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 1 - Verification tolerances

Parameter	**Verification tolerances**
Annual energy consumption (AE)	The determined value* shall not exceed the declared value by more than 4,00 %.
Energy Index (EI) for commercial vacuum cleaners	The determined value* shall not exceed the declared value by more than 4,00 %.
Dust pick up on carpet (dpu_c)	The determined value* shall not be lower than the declared value by more than 0,087.
Dust pick up on hard floor (dpu_{hf})	The determined value* shall not be lower than the declared value by more than 0,053.
Debris pick up on carpet (deb_c)	The determined value* shall not be lower than the declared value by more than 8,00%
Debris pick up on hard floor (deb_{hf})	The determined value* shall not be lower than the declared value by more than 8,00%
Dust re-emission (*dre*)	The determined value* shall not exceed the declared value by more than 0,12 %.
Power consumption in maintenance mode (M_h)	The determined value* shall not exceed the declared value by more than 0,10 W
Measured recharging energy $E_{measured}$	The determined value* shall not exceed the declared value by more than 1,00 %.
Sound power level	The determined value* shall not exceed the declared value.

Operational motor lifetime	The determined value* shall not be lower than the declared value by more than 5%.

ANNEX V

Benchmarks

At the time of entry into force of this Regulation, the best available technology on the market for products in the scope are given in table 2 below. Note that these are best values for single parameters. There are as yet no products featuring a combination of all these best values, because there are trade-offs between annual energy and maximum operating power on one hand versus cleaning performance (dpu_c in particular) and/or sound power on the other hand.

Table 2 – Benchmark values

Parameter	Mains operated household	Mains operated commercial	Cordless
Maximum operating power	350 W	350 W	95 W
Annual Energy	9,9 kWh/year	N/A	5,59 kWh/year
Energy Index	N/A	5,9 m^2/min	N/A
dpu_{hf}	1,11	1,13	106,5
dpu_c	0,81	0,92	91,5
deb_{hf}		1,00	
deb_c		N/A	
dre	0,0002%.	0,0001%.	0,001%.
Sound power level	62 dB(A)	68 dB(A)	77 dB(A)
Battery lifetime	N/A	N/A	Up to 1000 cycles with no significant capacity reduction

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