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COMMISSION REGULATION (EU) 2019/2022

of 1 October 2019

laying down ecodesign requirements for household dishwashers 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) No 1016/2010

(Text with EEA relevance)

(OJ L 315, 5.12.2019, p. 267)

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**COMMISSION REGULATION (EU) 2019/2022****of 1 October 2019****laying down ecodesign requirements for household dishwashers 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) No 1016/2010****(Text with EEA relevance)***Article 1***Subject matter and scope**

1. This Regulation establishes ecodesign requirements for the placing on the market or the putting into service of electric mains-operated household dishwashers, including built-in household dishwashers and electric mains-operated household dishwashers that can also be powered by batteries.

2. This Regulation shall not apply to:

- (a) dishwashers in the scope of Directive 2006/42/EC;
- (b) battery-operated household dishwashers that can be connected to the mains through an AC/DC converter purchased separately.

*Article 2***Definitions**

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

- (1) ‘mains’ or ‘electric mains’ means the electricity supply from the grid of 230 (\pm 10 %) volts of alternating current at 50 Hz;
- (2) ‘household dishwasher’ means a machine which cleans and rinses tableware, and which is declared by the manufacturer in the Declaration of Conformity to comply with Directive 2014/35/EU of the European Parliament and of the Council ⁽¹⁾ or with Directive 2014/53/EU of the European Parliament and of the Council ⁽²⁾;
- (3) ‘built-in household dishwasher’ means a household dishwasher that is designed, tested and marketed exclusively:
 - (a) to be installed in cabinetry or encased (top, bottom and sides) by panels;
 - (b) to be securely fastened to the sides, top or floor of the cabinetry or panels; and

⁽¹⁾ Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (OJ L 96, 29.3.2014, p. 357).

⁽²⁾ Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC (OJ L 153, 22.5.2014, p. 62).

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- (c) to be equipped with an integral factory-finished face or to be fitted with a custom front panel;
- (4) ‘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;
- (5) ‘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;
- (6) ‘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;
- (7) ‘programme’ means a series of operations that are pre-defined and are declared by the manufacturer, importer or authorised representative as suitable for specified levels of soil or types of load, or both;
- (8) ‘eco’ means the name of the programme of a household dishwasher declared by the manufacturer, importer or authorised representative as suitable to clean normally soiled tableware, and to which the ecodesign requirements on energy efficiency, cleaning and drying performance relate.

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 the conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain the declared values of parameters listed in Annex II, points 2, 3 and 4, and the details and the results of the calculations undertaken in accordance with Annex III.
3. Where the information included in the technical documentation for a particular model has been obtained:

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- (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.

The technical documentation shall include a list of all equivalent models, including the model identifiers.

4. The technical documentation shall include the information in the order and as set out in Annex VI of Regulation (EU) 2019/2017. For market surveillance purposes, manufacturers, importers or authorised representatives may, without prejudice to Annex IV, point 2(g) of Directive 2009/125/EC, refer to the technical documentation uploaded to the product database which contains the same information laid down in Regulation (EU) 2019/2017.

*Article 5***Verification procedure for market surveillance purposes**

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

▼M1*Article 6***Circumvention and software updates**

The manufacturer, importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (for example by recognising the test conditions or test cycle) and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters in the technical documentation or included in any documentation provided.

The energy consumption 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 explicit consent of the end-user prior to the update. No performance change shall occur as a result of rejecting the update.

A software update shall never have the effect of changing the product's performance in a way that makes it non-compliant with the ecodesign requirements applicable for the declaration of conformity.

▼B*Article 7***Indicative benchmarks**

The indicative benchmarks for the 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 shall present the results of this review, including, if appropriate, a draft revision proposal, to the Consultation Forum by 25 December 2025.

The review shall in particular focus on the following:

- (a) the improvement potential with regard to energy and environmental performance of household dishwashers, taking into account, inter alia, drying performance;
- (b) the level of verification tolerances;
- (c) an assessment of the evolution of consumer behaviour and of the penetration rate of household dishwashers in EU Member States;
- (d) the effectiveness of existing requirements on resource efficiency;
- (e) the appropriateness of setting additional resource efficiency requirements for products in accordance with the objectives of the circular economy, including whether more spare parts should be included.

*Article 9***Amendment to Regulation (EC) No 1275/2008**

In point 1 of Annex I to Regulation (EC) No 1275/2008, the entry ‘Dish washing machines’ is deleted.

*Article 10***Repeal**

Regulation (EU) No 1016/2010 is repealed as of 1 March 2021.

*Article 11***Transitional measures**

As from 25 December 2019 until 28 February 2021, by way of derogation to the requirement in Annex I, Point 1(1) of Regulation (EU) No 1016/2010, the name ‘eco’ may be used for the standard programme, in accordance with Point 1 of Annex II of this Regulation, instead of the name ‘standard programme’.

▼ B*Article 12***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*. It shall apply from 1 March 2021. However, Article 6, first paragraph, and Article 11 shall apply from 25 December 2019.

▼ M1*Article 13***Transitional compliance equivalence**

If no unit belonging to the same model or equivalent models was placed on the market before 1 November 2020, the units of models placed on the market between 1 November 2020 and 28 February 2021 which comply with the provisions of this regulation shall be considered compliant with the requirements of Regulation (EU) No 1016/2010

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



ANNEX I

Definitions applicable for the annexes

The following definitions shall apply:

- (1) ‘Energy Efficiency Index’ (EEI) means the ratio of the eco programme energy consumption to the standard programme energy consumption;
- (2) ‘eco programme energy consumption’ (EPEC) means the energy consumption of a household dishwasher for the eco programme, expressed in kilowatt hour per cycle;
- (3) ‘standard programme energy consumption’ (SPEC) means the energy consumption taken as a reference as a function of the rated capacity, expressed in kilowatt hour per cycle;
- (4) ‘place setting’ (ps) means a set of tableware for use by one person, not including serving pieces;
- (5) ‘serving pieces’ means items for the preparation and serving of food which can include pots, serving bowls, serving cutlery and a platter;
- (6) ‘rated capacity’ means the maximum number of place settings together with the serving pieces, which can be cleaned, rinsed and dried in a household dishwasher in one cycle when loaded in accordance with the manufacturer’s, importer’s or authorised representative’s instructions;
- (7) ‘cleaning performance index’ (I_C) means the ratio of the cleaning performance of a household dishwasher to the cleaning performance of a reference household dishwasher;
- (8) ‘drying performance index’ (I_D) means the ratio of the drying performance of a household dishwasher to the drying performance of a reference household dishwasher;
- (9) ‘programme duration’ (T_i) means the length of time beginning with the initiation of the programme selected, excluding any user programmed delay, until the end of the programme is indicated and the user has access to the load;
- (10) ‘cycle’ means a complete cleaning, rinsing and drying process, as defined by the programme selected, consisting of a series of operations until all activity ceases;
- (11) ‘off mode’ means a condition in which the household dishwasher is connected to the mains and is not providing any function; the following shall also be considered as off mode:
 - (a) conditions providing only an indication of off mode;
 - (b) conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2014/30/EU of the European Parliament and of the Council ⁽¹⁾;
- (12) ‘standby mode’ means a condition where the household dishwasher is connected to the mains, and provides only the following functions, which may persist for an indefinite time:
 - (a) reactivation function, or reactivation function and a mere indication of enabled reactivation function; and/or
 - (b) reactivation function through a connection to a network; and/or
 - (c) information or status display; and/or
 - (d) detection function for emergency measures;

⁽¹⁾ Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (OJ L 96, 29.3.2014, p. 79).

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- (13) 'network' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols);
- (14) 'delay start' means a condition where the user has selected a specified delay to the beginning of the cycle of the selected programme;
- (15) 'spare part' means a separate part that can replace a part with the same or similar function in a product;
- (16) 'professional repairer' means an operator or undertaking which provides services of repair and professional maintenance of household dishwashers;
- (17) 'eco programme water consumption' (EPWC) means the water consumption of a household dishwasher for the eco programme, expressed in litres per cycle;
- (18) 'guarantee' means any undertaking by the retailer or a manufacturer to the consumer to:
 - (a) reimburse the price paid; or
 - (b) replace, repair or handle household dishwashers in any way if they do not meet the specifications set out in the guarantee statement or in the relevant advertising.



ANNEX II

Ecodesign requirements

1. PROGRAMME REQUIREMENTS

From 1 March 2021, household dishwashers shall provide an eco programme meeting the following requirements:

- (a) this programme shall be:
 - named 'eco' on the programme selection device of the household dishwasher, on the household dishwasher display, if any, and on the relevant network application, if any,
 - set as the default programme for household dishwashers equipped with automatic programme selection or any function maintaining the selection of a programme, or, if there is no automatic programme selection, available for direct selection without the need for any other selection such as a specific temperature or load;
- (b) the name 'eco' shall be used exclusively for this programme. The formatting of 'eco' is not restricted in terms of font, font size, case sensitivity or colour. The only other additional information which may be combined with the term 'eco' is the temperature of the eco programme;
- (c) the indications 'normal', 'daily', 'regular' and 'standard', and their translations in all EU official languages, shall not be used in programme names for the household dishwasher, neither alone nor in combination with other information.

2. ENERGY EFFICIENCY REQUIREMENTS

From 1 March 2021, household dishwashers shall meet the following requirements:

- (a) the Energy Efficiency Index (EEI) shall be less than 63.

From 1 March 2024, household dishwashers shall meet the following requirement:

- (b) the EEI shall be less than 56 for household dishwashers with a rated capacity equal to or more than 10 place settings.

The EEI shall be calculated in accordance with Annex III.

3. FUNCTIONAL REQUIREMENTS

From 1 March 2021, household dishwashers shall meet the following requirements:

- (a) the cleaning performance index (I_C) shall be greater than 1,12;
- (b) the drying performance index (I_D) shall be greater than 1,06 for household dishwashers with a rated capacity of more than 7 place settings;
- (c) the drying performance index (I_D) shall be greater than 0,86 for household dishwashers with a rated capacity equal to or less than 7 place settings.

The I_C and the I_D shall be calculated in accordance with Annex III.

▼B**4. LOW POWER MODES**

From 1 March 2021, household dishwashers shall meet the following requirements:

- (a) household dishwashers shall have an off mode or a standby mode or both. The power consumption of these modes shall not exceed 0,50 W;
- (b) if the standby mode includes the display of information or status, the power consumption of this mode shall not exceed 1,00 W;
- (c) if the standby mode provides for a connection to a network and provides networked standby as defined in Commission Regulation (EU) No 801/2013 ⁽¹⁾, the power consumption of this mode shall not exceed 2,00 W;
- (d) at the latest 15 minutes after the household dishwasher has been switched on or after the end of any programme and associated activities or after any interaction with the equipment, if no other mode, including emergency measures, is triggered, the equipment shall switch automatically to off mode or standby mode;
- (e) if the household dishwasher provides for a delay start, the power consumption in this condition, including any standby mode, shall not exceed 4,00 W. The delay start shall not be programmable by the user for more than 24 h;
- (f) any household dishwasher that can be connected to a network shall provide the possibility to activate and deactivate the network connection. The network connection shall be deactivated by default.

5. RESOURCE EFFICIENCY REQUIREMENTS

From 1 March 2021, household dishwashers shall meet the following requirements:

- (1) availability of spare parts:
 - (a) the manufacturers, importers or authorised representatives of household dishwashers shall make available to professional repairers at least the following spare parts, for a minimum period of seven years after placing the last unit of the model on the market:
 - motor;
 - circulation and drain pump;
 - heaters and heating elements, including heat pumps (separately or bundled);
 - piping and related equipment including all hoses, valves, filters and aquastops;
 - structural and interior parts related to door assemblies (separately or bundled);
 - printed circuit boards;
 - electronic displays;
 - pressure switches;
 - thermostats and sensors;
 - software and firmware including reset software;

⁽¹⁾ 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 (OJ L 225, 23.8.2013, p. 1).

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- (b) the manufacturers, importers or authorised representatives of household dishwashers shall make available to professional repairers and end-users at least the following spare parts: door hinge and seals, other seals, spray arms, drain filters, interior racks and plastic peripherals such as baskets and lids, for a minimum period of 10 years after placing the last unit of the model on the market;
 - (c) the manufacturers, importers or authorised representatives of household dishwashers shall ensure that the spare parts mentioned in points (a) and (b) can be replaced with the use of commonly available tools and without permanent damage to the appliance;
 - (d) the list of spare parts concerned by 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;
 - (e) the list of spare parts concerned by point (b) and the procedure for ordering them and the repair instructions shall be publicly available on the free access website of the manufacturer, importer or authorised representative, when placing the first unit of a model on the market and until the end of the period of availability of these spare parts;
- (2) maximum delivery time of spare parts:
- (a) during the period 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;
 - (b) 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);
- (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 (1), the manufacturer, importer or authorised representative shall provide access to the appliance 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 authorised representatives may require the professional repairer to demonstrate that:
 - (i) the professional repairer has the technical competence to repair household dishwashers 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 the request;

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- (c) the 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;

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;

the available repair and maintenance information shall include:

- the unequivocal appliance identification;
- a disassembly map or exploded view;
- 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 household dishwasher (where applicable);

- (4) information requirements for refrigerant gases:

without prejudice to Regulation (EU) No 517/2014 of the European Parliament and of the Council ⁽²⁾, for household dishwashers equipped with a heat pump, the chemical name of the refrigerant gas used, or equivalent reference such as a commonly used and understood symbol, label or logo, shall be displayed permanently and in a visible and readable way on the exterior of the appliance, for example on the back panel. More than one reference can be used for the same chemical name;

- (5) requirements for dismantling for material recovery and recycling while avoiding pollution:

- manufacturers, importers or authorised representatives shall ensure that household dishwashers are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU can be removed with the use of commonly available tools,
- manufacturers, importers or authorised representatives shall fulfil the obligations laid down in Article 15, Point 1 of Directive 2012/19/EU.

6. INFORMATION REQUIREMENTS

User and installer 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) information that the eco programme is suitable to clean normally soiled tableware, that for this use, it is the most efficient programme in terms of its combined energy and water consumption, and that it is used to assess compliance with the EU ecodesign legislation;

⁽²⁾ Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 (OJ L 150, 20.5.2014, p. 195).

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- (2) information that loading the household dishwasher up to the capacity indicated by the manufacturer will contribute to energy and water savings and information on correct loading of tableware and main consequences of incorrect loading;
- (3) information that manual pre-rinsing of tableware items leads to increased water and energy consumption and is not recommended;
- (4) information that washing tableware in a household dishwasher usually consumes less energy and water in the use phase than hand dishwashing when the household dishwasher is used according to the manufacturer's instructions;
- (5) values on the programme duration, energy and water consumption for all programmes that offer a cycle;
- (6) information that the values given for programmes other than the eco programme are indicative only; and,
- (7) instruction on how to find the model information stored in the product database, as set out in Regulation (EU) 2019/2017 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.

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

- (8) correct installation (including level positioning, connection to mains, connection to water inlets, cold and/or hot if appropriate);
- (9) correct use of detergent, salt and other additives, and main consequences of incorrect dosage;
- (10) foreign object removal from the household dishwasher;
- (11) periodic cleaning, including optimal frequency and limescale prevention, and procedure;
- (12) periodic checks of filters, including optimal frequency, and procedure;
- (13) identification of errors, the meaning of the errors, and the action required, including identification of errors requiring professional assistance;
- (14) how to access professional repair (internet webpages, addresses, contact details).

Such instructions shall also include information on:

- (15) any implications of self-repair or non-professional repair for the safety of the end-user and for the guarantee;
- (16) the minimum period during which spare parts for the household dishwasher are available.



ANNEX III

Measurement methods and calculations

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards 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 eco programme at rated capacity shall be used for the measurement and calculation of the Energy Efficiency Index (EEI), water consumption, programme duration, cleaning and drying performance, and airborne acoustical noise emissions of a household dishwasher model. The energy consumption, water consumption, programme duration, cleaning and drying performance shall be measured concurrently.

The eco programme water consumption (EPWC) is expressed in litres per cycle and rounded to one decimal place.

The duration of the eco programme (T_e) is expressed in hours and minutes and rounded to the nearest minute.

1. ENERGY EFFICIENCY INDEX

For the calculation of the EEI of a household dishwasher model, the eco programme energy consumption ('EPEC') of the household dishwasher is compared to its standard programme energy consumption ('SPEC').

(a) The EEI is calculated as follows and rounded to one decimal place:

$$EEI = (EPEC/SPEC) \times 100$$

where:

EPEC is the eco programme energy consumption of the household dishwasher measured in kWh/cycle and rounded to three decimal places;

SPEC is the standard programme energy consumption of the household dishwasher.

(b) The SPEC is calculated in kWh/cycle and rounded to three decimal places as follows:

(i) for household dishwashers with rated capacity $p_s \geq 10$ and width > 50 cm:

$$SPEC = 0,025 \times p_s + 1,350$$

(ii) for household dishwashers with rated capacity $p_s \leq 9$ or width ≤ 50 cm:

$$SPEC = 0,090 \times p_s + 0,450$$

where p_s is the number of place settings.

2. CLEANING PERFORMANCE INDEX

For the calculation of the cleaning performance index (I_C) of a household dishwasher model, the cleaning performance of the eco programme is compared to the cleaning performance of a reference dishwasher.

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The I_C is calculated as follows and rounded to two decimal places:

$$I_C = \exp (\ln I_C)$$

and

$$\ln I_C = (1/n) \times \sum_{i=1}^n \ln(C_{T,i}/C_{R,i})$$

where:

$C_{T,i}$ is the cleaning performance of the eco programme of the household dishwasher under test for one test run (i), rounded to two decimal places;

$C_{R,i}$ is the cleaning performance of the reference dishwasher for one test run (i), rounded to two decimal places;

n is the number of test runs.

3. DRYING PERFORMANCE INDEX

For the calculation of the drying performance index (I_D) of a household dishwasher model, the drying performance of the eco programme is compared to the drying performance of the reference dishwasher.

The I_D is calculated as follows and rounded to two decimal places:

$$I_D = \exp (\ln I_D)$$

and

$$\ln I_D = (1/n) \times \sum_{i=1}^n \ln(I_{D,i})$$

where:

$I_{D,i}$ is the drying performance index of the eco programme of the household dishwasher under test for one test run (i);

n is the number of combined cleaning and drying test runs.

The $I_{D,i}$ is calculated as follows and rounded to two decimal places:

$$\ln I_{D,i} = \ln (D_{T,i}/D_{R,t})$$

where:

$D_{T,i}$ is the average drying performance score of the eco programme of the household dishwasher under test for one test run (i), rounded to two decimal places;

$D_{R,t}$ is the target drying score of the reference dishwasher, rounded to two decimal places.

4. LOW POWER MODES

The power consumption of the off mode (P_o), standby mode (P_{sm}) and where applicable delay start (P_{ds}) are measured. The measured values are expressed in W and rounded to two decimal places.

During measurements of the power consumption in low power modes, the following shall be checked and recorded:

- the display or not of information,
- the activation or not of a network connection.

*ANNEX IV***Verification procedure for market surveillance purposes**

The verification tolerances defined in this Annex relate only to the verification of the declared parameters by Member State authorities and shall not be used by the manufacturer, importer or authorised representative 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.

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, importer or authorised representative 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, importer or authorised representative does not contain values that are more favourable for the manufacturer, importer or authorised representative than the declared values; and
 - (c) when the Member States 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 States authorities check the unit of the model, it complies with programme requirements in point 1, resource efficiency requirements in point 5 and information requirements in point 6 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;
- (3) if the results referred to in point (2)(a), (b), (c) or (d) are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation;

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- (4) if the result referred to in point (2)(e) 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) or (6).

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

The Member State authorities shall only apply the verification tolerances that are set out in Table 1 and shall use only the procedure described in points 1 to 7 for the requirements referred to in this Annex. For the parameters in Table 1, 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
Eco programme energy consumption (EPEC)	The determined value (*) shall not exceed the declared value of EPEC by more than 5 %.
Eco programme water consumption (EPWC)	The determined value (*) shall not exceed the declared value of EPWC by more than 5 %.
Cleaning performance index (I_C)	The determined value (*) shall not be less than the declared value of I_C by more than 14 %.
Drying performance index (I_D)	The determined value (*) shall not be less than the declared value of I_D by more than 12 %.
Programme duration (T_i)	The determined value (*) shall not exceed the declared value by more than 5 % or 10 minutes, whichever is the longer.
Power consumption in off mode (P_o)	The determined value (*) of power consumption P_o shall not exceed the declared value by more than 0,10 W.
Power consumption in standby mode (P_{sm})	The determined value (*) of power consumption P_{sm} shall not exceed the declared value by more than 10 % if the declared value is higher than 1,00 W, or by more than 0,10 W if the declared value is lower than or equal to 1,00 W.
Power consumption in delay start (P_{ds})	The determined value (*) of power consumption P_{ds} shall not exceed the declared value by more than 10 % if the declared value is higher than 1,00 W, or by more than 0,10 W if the declared value is lower than or equal to 1,00 W.

(*) In the case of three additional units tested as prescribed in point 4, the determined value means the arithmetical mean of the values determined for these three additional units.

*ANNEX V***Benchmarks****1. INDICATIVE BENCHMARKS FOR HOUSEHOLD DISWASHERS ON WATER AND ENERGY CONSUMPTION, AIRBORNE ACOUSTICAL NOISE EMISSIONS AND PROGRAMME DURATION**

At the time of entry into force of this Regulation, the best available technology on the market for household dishwashers in terms of their energy efficiency, energy and water consumption, airborne acoustical noise emissions and programme duration for the eco programme was identified as follows:

- (1) household dishwashers with 14 place settings (without heat pump technology):
 - (a) energy consumption: 0,67 kWh/cycle;
 - (b) water consumption: 9,9 L/cycle;
 - (c) airborne acoustic noise emissions: 44 dB(A);
 - (d) programme duration: 222 minutes (3 hours and 42 minutes);
- (2) household dishwashers with 13 place settings (with heat pump technology):
 - (a) energy consumption: 0,55 kWh/cycle;
 - (b) water consumption: 8,8 L/cycle;
 - (c) airborne acoustic noise emissions: 46 dB(A);
 - (d) programme duration: 295 minutes (4 hours and 55 minutes);
- (3) household dishwashers with 10 place settings:
 - (a) energy consumption: 0,66 kWh/cycle;
 - (b) water consumption: 9,5 L/cycle;
 - (c) airborne acoustic noise emissions: 44 dB(A);
 - (d) programme duration: 195 minutes (3 hours and 15 minutes);
- (4) household dishwashers with 6 place settings:
 - (a) energy consumption: 0,62 kWh/cycle;
 - (b) water consumption: 8,0 L/cycle;
 - (c) airborne acoustic noise emissions: 48 dB(A);
 - (d) programme duration: 225 minutes (3 hours and 45 minutes).

2. INDICATIVE BENCHMARKS FOR HOUSEHOLD DISWASHERS ON POWER CONSUMPTION IN LOW POWER MODES

At the time of entry into force of this Regulation, the best available technology on the market for household dishwashers in terms of their power consumption in low power modes is:

- (1) standby mode: 0,20 W;
- (2) networked standby condition: Ethernet 0,60 W, Wi-Fi 0,70 W.