EUROPEAN COMMISSION

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Draft

COMMISSION REGULATION (EU) No …/..

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

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(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products[1], and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

(1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having significant environmental impact and presenting significant potential for improvement in terms of their environmental impact without entailing excessive costs.

(2) Article 16(2), first indent, of Directive 2009/125/EC provides that in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission shall, as appropriate, introduce an implementing measure for domestic appliances, including household dishwashers.

(3) The Commission has carried out a preparatory study to analyse the technical, environmental and economic aspects of household dishwashers typically used in households. The study has been developed together with stakeholders and interested parties from the Community and third countries, and the results have been made publicly available.

(4) This Regulation should cover products designed for washing tableware in households.

(5) The environmental aspect of household dishwashers, identified as significant for the purposes of this Regulation, is energy consumption in the use phase. The annual electricity consumption of products subject to this Regulation was estimated to have been 24.7 TWh in the Community in 2005 corresponding to 13 million tonnes of CO_2. Unless specific measures are taken, annual electricity consumption is estimated to

[1] OJ L 285, 31.10.2009, p. 10–35

increase to 35 TWh in 2020. The preparatory study shows that the electricity and water consumption of products subject to this Regulation can be significantly reduced.

(6) The preparatory study shows that requirements regarding other ecodesign parameters referred to in Annex I, Part 1, of Directive 2009/125/EC are not necessary as electricity consumption of household dishwashers in the use phase is by far the most important environmental aspect.

(7) The electricity consumption of products subject to this Regulation should be made more efficient by applying existing non-proprietary cost effective technologies that can reduce the combined costs of purchasing and operating these products.

(8) The ecodesign requirements should not affect functionality from the end-user's perspective and should not negatively affect health, safety or the environment. In particular, the benefits of reducing electricity consumption during the use phase should more than offset any additional environmental impacts during the production phase.

(9) The ecodesign requirements should be introduced gradually in order to provide a sufficient timeframe for manufacturers to re-design products subject to this Regulation. The timing should be set in such a way as to avoid negative impacts on the functionalities of equipment on the market, and to take into account cost impacts for end-users and manufacturers, in particular small and medium-sized enterprises, while ensuring timely achievement of the objectives of this Regulation.

(10) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation bodies, as listed in Annex I to Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services[2].

(11) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures.

(12) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes V and VI of Directive 2009/125/EC insofar as this information relates to the requirements laid down in this Regulation.

(13) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure the wide availability and easy accessibility of information on the life-cycle environmental performance of products subject to this Regulation.

(14) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2005/32/EC,

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[2] OJ L 204, 21.7.1998, p. 37.

HAS ADOPTED THIS REGULATION:

Article 1
Subject matter and scope

This Regulation establishes eco-design requirements for the placing on the market of electric mains-operated household dishwashers and electric mains-operated household dishwashers that can also be powered by batteries, including those sold for non-household use.

Article 2
Definitions

In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply for the purpose of this Regulation:

(1) "household dishwasher" means a machine which cleans, rinses, and dries dishware, glassware, cutlery, and, cooking utensils by chemical, mechanical, thermal, and electric means and which is designed to be used principally for non-professional purposes;

(2) "place settings" means a defined set of crockery, glass and cutlery for use by one person;

(3) "rated capacity" means the maximum number of place settings together with the serving pieces, as stated by the manufacturer, which can be treated in a household dishwasher on the programme selected when loaded in accordance with the manufacturer's instructions;

(4) "programme" means a series of operations which are pre-defined and which are declared as suitable by the manufacturer for specified levels of soil or types of load, or both, and together form a complete cycle;

(5) "programme time" means the time that elapses from the initiation of the programme (excluding any user-programmed delay) until the completion of the programme;

(6) "cycle" means a complete cleaning, rinsing, and drying process, as defined for the selected programme;

(7) "off-mode" means a condition where the household dishwasher is switched off using appliance's controls or switches accessible to and intended for operation by the end-user during normal use to attain the lowest power consumption that may persist for an indefinite time while the household dishwasher is connected to a power source and used in accordance with the manufacturer's instructions. Where there are no controls, 'off-mode' means the condition reached after the household dishwasher is left to revert to a steady-state power consumption of its own accord;

(8) "left-on mode" means the lowest power consumption mode that may persist for an indefinite time after completion of the programme and unloading of the machine without any further intervention of the end-user;

(9) "equivalent dishwasher" means a model of household dishwasher placed on the market with the same rated capacity, technical and performance characteristics, energy and water consumption and airborne acoustical noise emissions as another model of household dishwasher placed on the market under a different commercial code number by the same manufacturer.

Article 3
Ecodesign requirements

The generic ecodesign requirements for household dishwashers are set out in Annex I, point 1. The specific ecodesign requirements for household dishwashers are set out in Annex I, point 2.

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 file shall contain the results of the calculation set out in Annex II to this Regulation.

Where the information included in the technical documentation for a particular household dishwasher model has been obtained by calculation on the basis of design, or extrapolation from other equivalent household dishwashers, or both, the technical documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by manufacturers to verify the accuracy of the calculations undertaken. In such cases, the technical documentation shall also include a list of all other equivalent household dishwasher models where the information included in the technical documentation was obtained on the same basis.

Article 5
Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC for the requirements set out in Annex I to this Regulation, the Member State authorities shall apply the verification procedure described in Annex III to this Regulation.

Article 6
Benchmarks

The indicative benchmarks for best-performing household dishwashers available on the market at the time of entry into force of this Regulation are set out in Annex IV.

Article 7
Revision

The Commission shall review this Regulation in the light of technological progress no later than five years after its entry into force and present the result of this review to the Ecodesign Consultation Forum. The review shall in particular assess the verification tolerances set out in Annex III.

Article 8
Entry into force

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

2. The generic ecodesign requirements set out in Annex I, point 1, shall apply from [date to be inserted: two years after the publication in the *Official Journal of the European Union of the Regulation*] ;

   The specific ecodesign requirements set out in point 2(1) of Annex I shall apply from [date to be inserted: one year after the publication in the *Official Journal of the European Union of the Regulation*] ;

   The specific ecodesign requirements set out in point 2(2) of Annex I shall apply from [date to be inserted: four years after the publication in the *Official Journal of the European Union of the Regulation*].

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

Done at Brussels, […]

For the Commission

The President

ANNEX I
Ecodesign requirements

1. Generic ecodesign requirements

(1) For the calculation of the energy consumption and other parameters for household dishwashers, the cycle which cleans normally soiled tableware (hereafter "standard cleaning cycle") shall be used. This cycle shall be clearly identifiable on the programme selection device of the household dishwasher or the household dishwasher display, if any, or both, and named 'standard programme' and shall be set as the default cycle for household dishwashers equipped with automatic programme selection or any function for automatically selecting a cleaning programme or maintaining the selection of a programme.

(2) The booklet of instructions provided by the manufacturer shall provide:

(a) the standard cleaning cycle referred to as 'standard programme' and shall specify that it is suitable to clean normally soiled tableware and that it is the most efficient programme in terms of its combined energy and water consumption for that type of tableware;

(b) the power consumption of the off-mode and of the left-on mode;

(c) indicative information on the programme time, energy and water consumption for the main washing programmes.

2. Specific ecodesign requirements

Household dishwashers shall comply with the following requirements:

(1) From [date to be inserted: one year after the publication in the *Official Journal of the European Union of the Regulation*] :

(a) for all household dishwashers, except household dishwashers with a rated capacity of 10 place settings and a width equal to or less than 45 cm, the Energy Efficiency Index (*EEI*) shall be less than 71;

(b) for household dishwashers with a rated capacity of 10 place settings and a width equal to or less than 45 cm, the Energy Efficiency Index (*EEI*) shall be less than 80;

(c) for all household dishwashers, the Cleaning Efficiency Index (I_C) shall be greater than 1.12.

(2) From [date to be inserted: four years after the publication in the *Official Journal of the European Union of the Regulation*]:

(a) for household dishwashers with a rated capacity equal to or higher than 7 place settings, the Energy Efficiency Index (*EEI*) shall be less than 63;

(b) for household dishwashers with a rated capacity equal to or higher than 8 place settings, the Drying Efficiency Index (I_D) shall be greater than 1.08;

(c) for household dishwashers with a rated capacity equal to or less than 7 place settings, the Drying Efficiency Index (I_D) shall be greater than 0.86.

The Energy Efficiency Index (*EEI*), the Cleaning Efficiency Index (I_C) and the Drying Efficiency Index (I_D) of household dishwashers are calculated in accordance with Annex II.

ANNEX II
Method for calculating the Energy Efficiency Index, the Cleaning Efficiency Index and the Drying Efficiency Index

1. CALCULATION OF THE ENERGY EFFICIENCY INDEX

For the calculation of the Energy Efficiency Index (EEI) of a household dishwasher model, the Annual Energy Consumption of the household dishwasher is compared to its Standard Energy Consumption.

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

$$EEI = \frac{AE_C}{SAE_C} \times 100$$

where:

AE_C = Annual Energy Consumption of the household dishwasher;

SAE_C = Standard Annual Energy consumption of the household dishwasher.

(b) The Annual Energy Consumption (AE_c) is calculated in kWh/year as follows and rounded to two decimal places:

(i) $$AE_C = E_t \times 280 + \frac{\left[P_o \times \frac{525600 - (T_t \times 280)}{2} + P_l \times \frac{525600 - (T_t \times 280)}{2} \right]}{60 \times 1000}$$

where:

E_t = energy consumption for the standard cycle, in kWh and rounded to three decimal places;

P_l = power in “left-on mode” for the standard cleaning cycle, in W and rounded to two decimal places;

P_o = power in “off-mode” for the standard cleaning cycle, in W and rounded to two decimal places;

T_t = programme time for the standard cleaning cycle, in minutes and rounded to the nearest minute.

(ii) When power management is enforced, with the household dishwasher reverting automatically to ‘off-mode’ after the end of the programme, AE_C is calculated taking into consideration the effective duration of 'left-on mode', according to the following formula:

$$AE_C = E_t \times 280 + \frac{\{(P_l \times T_l \times 280) + P_o \times [525600 - (T_t \times 280) - (T_l \times 280)]\}}{60 \times 1000}$$

where:

T_l = measured time in "left-on mode" for the standard cleaning cycle, in minutes and rounded to the nearest minute;

280 = total number of standard cleaning cycles per year.

(c) The Standard Annual Energy Consumption SAE_C is calculated in kWh/year as follows and rounded to two decimal places:

(i) for household dishwashers with rated capacity ps ≥ 10 and width > 50 cm:

$$SAE_C = 7{,}0 \times ps + 378$$

(ii) for household dishwashers with rated capacity $ps \leq 9$ and household dishwashers with rated capacity $9 < ps \leq 11$ and width ≤ 50 cm:

$$SAE_C = 25{,}2 \times ps + 126$$

where:

ps = number of place settings.

2. CALCULATION OF THE CLEANING EFFICIENCY INDEX

For the calculation of the Cleaning Efficiency Index (I_C) of a household dishwasher model, the cleaning efficiency of the household dishwasher is compared to the cleaning efficiency of a reference dishwasher, where the reference dishwasher shall have the characteristics indicated in the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

(a) The Cleaning Efficiency Index (I_C) is calculated as follows and rounded to two decimal places

$$\ln Ic = \frac{1}{n} \times \sum_{i=1}^{n} \ln \times \left(\frac{C_{T,i}}{C_{R,i}} \right)$$

$I_C = \exp(\ln I_C)$

where:

$C_{T,i}$ = cleaning efficiency of the household dishwasher under test for one test cycle (i)

$C_{R,i}$ = cleaning efficiency of the reference dishwasher for one test cycle (i)

n = number of test cycles, $n \geq 5$

(b) The cleaning efficiency *(C)* is the average of the soil score of each load item after completion of a standard cleaning cycle. The soil score is calculated as shown in Table 1:

Table 1

Number of small dot shaped soil particles (n)	Total soiled area (A_S) in mm^2	Soil score
$n = 0$	$A_S = 0$	5 (most efficient)
$0 < n \leq 4$	$0 < A_S \leq 4$	4
$4 < n \leq 10$	$0 < A_S \leq 4$	3
$10 < n$	$0 < A_S \leq 4$	2
Not applicable	$50 < A_S \leq 200$	1
Not applicable	$200 < A_S$	0 (least efficient)

3. CALCULATION OF THE DRYING EFFICIENCY INDEX

For the calculation of the Drying Efficiency Index (I_D) of a household dishwasher model, the drying efficiency of the household dishwasher is compared to the drying efficiency of a reference dishwasher, where the reference dishwasher shall have the characteristics indicated in the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

(a) The Drying Efficiency Index (I_D) is calculated as follows and rounded to two decimal places:

$$\ln I_D = \frac{1}{n} \times \sum_{i=1}^{n} \ln\left(\frac{D_{T,i}}{D_{R,i}}\right)$$

$I_D = \exp(\ln I_D)$

where:

$D_{T,i}$ = drying efficiency of the household dishwasher under test for one test cycle (i)

$D_{R,i}$ = drying efficiency of the reference dishwasher for one test cycle (i)

n = number of test cycles, $n \geq 5$

(b) The Drying Efficiency *(D)* is the average of the wet score of each load item after completion of a standard cleaning cycle. The wet score is calculated as shown in Table 2:

Table 2

Number of water traces *(W_T)* or wet streak *(W_S)*	Total wet area (Aw) in mm^2	Wet score
$W_T = 0$ and $W_S = 0$	Not applicable	2 (most efficient)
$1 < W_T \leq 2$ or $W_S = 1$	$Aw < 50$	1
$2 < W_T$ or $W_S = 2$ or $W_S = 1$ and $W_T = 1$	$Aw > 50$	0 (least efficient)

ANNEX III
Verification procedure for market surveillance purposes

For the purposes of checking conformity with the requirements laid down in Annex I, Member State authorities shall test a single household dishwasher. If the measured parameters do not meet the declared values within the meaning of Article 4(2) of the manufacturer within the range set out in Table 1, the measurements shall be carried out on three more household dishwashers. The arithmetic mean of the measured values of these three household dishwashers shall meet the requirements within the ranges defined in Table 1, except for the energy consumption where the measured value shall not be greater than the rated value of E_t by more than 6%.

Otherwise, the model and all other equivalent household dishwasher models shall be considered not to comply with the requirements laid down in Annex I.

Member States authorities shall use reliable, accurate and reproducible measurement procedures, which take into account the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

Table 1

Measured parameter	Verification tolerances
Annual energy consumption	The measured value shall not be greater than the rated value* of AE_C by more than 10 %.
Cleaning efficiency index	The measured value shall not be less than the rated value of I_C by more than 10 %.
Drying efficiency index	The measured value shall not be less than the rated value of I_D by more than 19 %.
Energy consumption	The measured value shall not be greater than the rated value of E_t by more than 10 %.
Programme time	The measured value shall not be longer than the rated values T_t by more than 10 %.
Power consumption in off-mode and left-on mode	The measured value of power consumption P_o and P_l of more than 1,00 W shall not be greater than the rated value by more than 10 %. The measured value of power consumption P_o and P_l of less than or equal to 1,00 W shall not be greater than the rated value by more than 0,10 W.
Duration of left-on mode	The value measured shall not be longer than the rated value of T_l by more than 10 %.

* "rated value" means a value declared by the manufacturer

ANNEX IV
Benchmarks

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, cleaning and drying efficiency and airborne acoustical noise emissions was identified as follows:

(1) Household dishwashers with 14 place settings (under-table model):

(a) energy consumption: 0.950 kWh/cycle, corresponding to an overall annual energy consumption of 278.5 kWh/year, of which 266 kWh/Year for 280 washing cycles and 12.5 kWh/year due to the low power modes

(b) water consumption: 10 litres/cycle, corresponding to 2 800 litres/year for 280 cycles

(c) cleaning efficiency index: $I_C > 1.12$

(d) drying efficiency index: $I_D > 1.08$

(e) airborne acoustical noise emissions: 41 dB(A) re 1pW

(2) Household dishwashers with 12 place settings (free-standing model):

(a) energy consumption: 0.950 kWh/cycle, corresponding to an overall annual energy consumption of 278.5 kWh/year, of which 266 kWh/year for 280 washing cycles and 12.5 kWh/year due to the low power modes

(b) water consumption: 9 litres/cycle, corresponding to 2 520 litres/year for 280 cycles

(c) cleaning efficiency index: $I_C > 1.12$

(d) drying efficiency index: $I_D > 1.08$

(e) airborne acoustical noise emissions: 41 dB(A) re 1pW

(3) Household dishwashers with 9 place settings (built-in model):

(a) energy consumption: 0.800 kWh/cycle, corresponding to an overall annual energy consumption of 236.5 kWh/year, of which 224 kWh/year for 280 washing cycles and 12.5 kWh/year due to the low power modes

(b) water consumption: 9 litres/cycle, corresponding to 2 520 litres/year for 280 cycles

(c) cleaning efficiency index: $I_C > 1.12$

(d) drying efficiency index: $I_D > 1.08$

(e) airborne acoustical noise emissions: 44 dB(A) re 1pW

(4) Household dishwashers with 6 place settings (built-in model):

(a) energy consumption: 0.63 kWh/cycle, corresponding to an overall annual energy consumption of 208.5 kWh/year, of which 196 kWh/year for 280 washing cycles and 12.5 kWh/year due to the low power modes

(b) water consumption: 7 litres/cycle, corresponding to 1 960 litres/year for 280 cycles

(c) cleaning efficiency index: $I_C > 1.12$

(d) drying efficiency index: $1{,}08 \geq I_D > 0.86$

(e) airborne acoustical noise emissions: 45 dB(A) re 1pW

(5) Household dishwashers with 4 place settings (free standing model):

(a) energy consumption: 0.51 kWh/cycle, corresponding to an overall annual energy consumption of 155.3 kWh/year, of which 142.8, kWh/year for 280 washing cycles and 12.5 kWh/year due to the low power modes;

(b) water consumption: 9.5 litres/cycle, corresponding to 2 660 litres/year for 280 cycles

(c) cleaning efficiency index: $I_C > 1.12$

(d) drying efficiency index: $1{,}08 \geq I_D > 0.86$

(e) airborne acoustical noise emissions: 53 dB(A) re 1pW