



EUROPEAN COMMISSION

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**COMMISSION REGULATION (EU) No .../..**

**of **XXX****

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

(Text with EEA relevance)

**COMMISSION REGULATION (EU) No .../..**

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

(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<sup>1</sup>, 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)(a) of Directive 2009/125/EC provides that the Commission should, as appropriate, introduce an implementing measure for domestic appliances, including household tumble driers.
- (3) The Commission has carried out a preparatory study to analyse the technical, environmental and economic aspects of household tumble driers typically used in households. The study has been developed together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.
- (4) This Regulation should cover products designed for drying laundry in households.
- (5) Household combined washer-driers have particular characteristics and should therefore be exempted from the scope of this Regulation.
- (6) The environmental aspect of household tumble driers, identified as significant for the purposes of this Regulation, is energy consumption in the use phase. The annual electricity consumption of household tumble driers is estimated to have been 21 TWh

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<sup>1</sup> OJ L 285, 31.10.2009, p. 10.

in the European Union in 2005. Unless specific measures are taken, annual electricity consumption is predicted to be 31 TWh in 2020. The preparatory study shows that the energy consumption of products subject to this Regulation can be significantly reduced.

- (7) The preparatory study shows that requirements regarding other ecodesign parameters as referred to in Annex I, Part 1, to Directive 2009/125/EC are not necessary, as the energy consumption of household tumble driers in the use phase is by far the most important environmental aspect. In accordance with Article 6(2) of Directive 2009/125/EC, Member States shall not prohibit, restrict or impede the placing on the market and/or putting into service, within their territories, of household tumble driers on grounds of ecodesign requirements relating to those ecodesign parameters referred to in Annex I, Part 1, of that Directive for which this Regulation provides that no ecodesign requirement is necessary.
- (8) The energy consumption of household tumble driers should be made more efficient by applying existing non-proprietary cost-effective technologies that can reduce the combined costs of purchasing and operating those products.
- (9) 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 energy consumption during the use phase should more than offset any additional environmental impacts during the production and disposal phases.
- (10) The ecodesign requirements should be introduced gradually in order to provide a sufficient timeframe for manufacturers to redesign products subject to this Regulation. The timing should be such 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.
- (11) Measurements of the relevant product parameters should be performed using 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<sup>2</sup>.
- (12) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures.
- (13) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes V and VI to Directive 2009/125/EC insofar as that information relates to the requirements laid down in this Regulation.

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<sup>2</sup> OJ L 204, 21.7.1998, p. 37.

- (14) 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.
- (15) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC,

HAS ADOPTED THIS REGULATION:

*Article 1*  
***Subject matter and scope***

1. This Regulation establishes ecodesign requirements for the placing on the market of electric mains-operated and gas-fired household tumble driers and built-in household tumble driers, including those sold for non-household use.
2. This Regulation shall not apply to household combined washer-driers and household spin-extractors.

*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 tumble drier’ means an appliance in which textiles are dried by tumbling in a rotating drum through which heated air is passed and which is designed to be used principally for non-professional purposes;
- (2) ‘built-in household tumble drier’ means a household tumble drier intended to be installed in a cabinet, a prepared recess in a wall or a similar location, requiring furniture finishing;
- (3) ‘household combined washer-drier’ means a household washing machine which includes both a spin extraction function and also a means for drying the textiles, usually by heating and tumbling;
- (4) ‘household spin-extractor’, also known commercially as ‘spin-drier’, means an appliance in which water is removed from the textiles by centrifugal action in a rotating drum and drained through an automatic pump and which is designed to be used principally for non-professional purposes;
- (5) ‘air-vented tumble drier’ means a tumble drier that draws in fresh air, passes it over the textiles and vents the resulting moist air into the room or outside;
- (6) ‘condenser tumble drier’ means a tumble drier which includes a device (either using condensation or any other means) for removing moisture from the air used for the drying process;

- (7) 'automatic tumble drier' means a tumble drier which switches off the drying process when a certain moisture content of the load is detected, for example through conductivity or temperature sensing;
- (8) 'non-automatic tumble drier' means a tumble drier which switches off the drying process after a predefined period, usually controlled by a timer, but which may also be manually switched off;
- (9) 'programme' means a series of operations that are predefined and which are declared by the manufacturer as suitable for drying certain types of textile;
- (10) 'cycle' means a complete drying process, as defined for the selected programme;
- (11) 'programme time' means the time that elapses from the initiation of the programme until the completion of the programme, excluding any end-user programmed delay;
- (12) 'rated capacity' means the maximum mass in kilograms, indicated by the manufacturer in 0.5 kilogram increments of dry textiles of a particular type, which can be treated in a household tumble drier with the selected programme, when loaded in accordance with the manufacturer's instructions;
- (13) 'partial load' means half of the rated capacity of a household tumble drier for a given programme;
- (14) 'condensation efficiency' means the ratio between the mass of moisture condensed by a condenser tumble drier and the mass of moisture removed from the load at the end of a cycle;
- (15) 'off-mode' means a condition where the household tumble drier is switched off using appliance 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 tumble drier is connected to a power source and used in accordance with the manufacturer's instructions; where there is no control or switch accessible to the end-user, 'off-mode' means the condition reached after the household tumble drier reverts to a steady-state power consumption on its own;
- (16) 'left-on mode' means the lowest power consumption mode that may persist for an indefinite time after completion of the programme without any further intervention by the end-user besides unloading of the household tumble drier;
- (17) 'equivalent household tumble drier' means a model of household tumble drier placed on the market with the same rated capacity, technical and performance characteristics, energy consumption, condensation efficiency where relevant, standard cotton programme time and airborne acoustical noise emissions during drying as another model of household tumble drier placed on the market under a different commercial code number by the same manufacturer.
- (18) 'standard cotton programme' means the cycle which dries cotton laundry with an initial moisture content of the load of 60% up to a remaining moisture content of the load of 0 %.

*Article 3*  
***Ecodesign requirements***

The generic ecodesign requirements for household tumble driers are set out in point 1 of Annex I. The specific ecodesign requirements for household tumble driers are set out in point 2 of Annex I.

No ecodesign requirement is necessary regarding any other ecodesign parameter referred to in Annex I, Part 1, of Directive 2009/125/EC.

*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 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 include a copy of the calculations set out in Annex II to this Regulation.

Where the information included in the technical documentation for a particular household tumble drier model has been obtained by calculation on the basis of design or by extrapolation from other equivalent household tumble driers, 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 tumble drier models where the information included in the technical documentation was obtained in the same way.

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

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

*Article 6*  
***Benchmarks***

The indicative benchmarks for best-performing household tumble driers 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 that review to the Ecodesign

Consultation Forum. The review shall in particular assess the verification tolerances set out in Annex III and the efficiency of air-vented appliances.

*Article 8*  
***Entry into force and application***

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. It shall apply from [date to be inserted: one year after the entry into force of the Regulation].

However:

- (a) the generic ecodesign requirements set out in points 1(1) and (2) of Annex I shall apply from [date to be inserted: two years after the entry into force of the Regulation];
- (b) the specific ecodesign requirements set out in point 2(2) of Annex I shall apply from [date to be inserted: three years after the entry into force of the Regulation].

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 tumble driers, the cycle which dries cotton laundry (with an initial moisture content of the load of 60%) up to a remaining moisture content of the load of 0% (hereinafter the 'standard cotton programme') shall be used. That cycle shall be clearly identifiable on the programme selection device(s) of the household tumble drier or the household tumble drier display, if any, or both, and indicated as 'standard cotton programme' or by a uniform symbol or an appropriate combination thereof, and shall be set as the default cycle for household tumble driers equipped with automatic programme selection or any function for automatically selecting a drying programme or maintaining the selection of a programme. If the tumble drier is automatic tumble drier the 'standard cotton programme' shall be automatic.
- (2) The booklet of instructions provided by the manufacturer shall provide:
  - (a) information about the 'standard cotton programme' and shall specify that it is suitable to dry normal wet cotton laundry and that it is the most efficient programme in terms of energy consumption for drying wet cotton laundry;
  - (b) the power consumption of the off-mode and the left-on mode;
  - (c) indicative information on the programme time and energy consumption for the main drying programmes at both full, and, if applicable, partial load;

**2. Specific ecodesign requirements**

Household tumble driers shall comply with the following requirements:

- (1) From [date to be inserted: one year after the entry into force of the Regulation]:
  - the Energy Efficiency Index (*EEI*) shall be less than 85;
  - for condenser household tumble driers the weighted condensation efficiency shall be not lower than 60 %.
- (2) From [date to be inserted: three years after the entry into force of the Regulation]:
  - for condenser household tumble driers the Energy Efficiency Index (*EEI*) shall be less than 76;
  - for condenser household tumble driers, the weighted condensation efficiency shall be not lower than 70 %.

The Energy Efficiency Index (*EEI*) and the weighted condensation efficiency are calculated in accordance with Annex II.



**ANNEX II**  
**Method for calculating the Energy Efficiency Index and weighted condensation efficiency**

**1. CALCULATION OF THE ENERGY EFFICIENCY INDEX**

For the calculation of the Energy Efficiency Index (*EEI*) of a household tumble drier model, the weighted Annual Energy Consumption of a household tumble drier for the standard cotton programme at full and partial load is compared to its Standard Annual 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:

- $AE_C$  = weighted Annual Energy Consumption of the household tumble drier;
- $SAE_C$  = Standard Annual Energy Consumption of the household tumble drier.

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

- for all household tumble driers that are not air-vented:

$$SAE_C = 140 \times c^{0.8}$$

- for air-vented household tumble driers:

$$SAE_C = 140 \times c^{0.8} - \left( 30 \times \frac{T_t}{60} \right)$$

where:

- $c$  is the rated capacity of the household tumble drier for the standard cotton programme;
- $T_t$  is the weighted programme time for the standard cotton programme.

- (c) The weighted Annual Energy Consumption ( $AE_C$ ) is calculated in kWh/year as follows and is rounded to two decimal places:

- (i):

$$AE_C = E_t \times 160 + \frac{\left[ P_o \times \frac{525600 - (T_t \times 160)}{2} + P_i \times \frac{525600 - (T_t \times 160)}{2} \right]}{60 \times 1000}$$

where:

- $E_t$  = weighted energy consumption, in kWh and rounded to two decimal places;
- $P_o$  = power in 'off-mode' for the standard cotton programme at full load, in W and rounded to two decimal places;
- $P_l$  = power in 'left-on mode' for the standard cotton programme at full load, in W and rounded to two decimal places;
- $T_t$  = weighted programme time, in minutes and rounded to the nearest minute;
- 160 = total number of drying cycles per year.

- (ii) When the household tumble drier is equipped with a power management system, with the household tumble drier reverting automatically to 'off-mode' after the end of the programme, the weighted Annual Energy Consumption ( $AE_C$ ) is calculated taking into consideration the effective duration of the 'left-on mode', according to the following formula:

$$AE_C = E_t \times 160 + \frac{\{(P_l \times T_l \times 160) + P_o \times [525600 - (T_t \times 160) - (T_l \times 160)]\}}{60 \times 1000}$$

where:

- $T_l$  = duration of the 'left-on mode' for the standard cotton programme at full load, in minutes and rounded to the nearest minute.

- (d) The weighted programme time ( $T_t$ ) for the standard cotton programme is calculated in minutes as follows and rounded to the nearest minute:

$$T_t = (3 \times T_{dry} + 4 \times T_{dry/2})/7$$

where:

- $T_{dry}$  = programme time for the standard cotton programme at full load, in minutes and rounded to the nearest minute;
- $T_{dry/2}$  = programme time for the standard cotton programme at partial load, in minutes and rounded to the nearest minute.

- (e) The weighted energy consumption ( $E_t$ ) is calculated in kWh as follows and rounded to two decimal places:

$$E_t = (3 \times E_{dry} + 4 \times E_{dry/2})/7$$

where:

- $E_{dry}$  = energy consumption of the standard cotton programme at full load, in kWh and rounded to two decimal places;
- $E_{dry/2}$  = energy consumption of the standard cotton programme at partial load, in kWh and rounded to two decimal places.

- (f) For gas-fired household tumble driers, the energy consumption for the standard cotton programme at full and partial load is calculated in kWh, rounded to two decimal places, as:

$$E_{dry} = \frac{Eg_{dry}}{f_g} + Eg_{dry,a}$$

$$E_{dry\frac{1}{2}} = \frac{Eg_{dry\frac{1}{2}}}{f_g} + Eg_{dry\frac{1}{2},a}$$

where:

- $Eg_{dry}$  = gas consumption of the standard cotton programme at full load, in kWh and rounded to two decimal places;
- $Eg_{dry\frac{1}{2}}$  = gas consumption of the standard cotton programme at partial load, in kWh and rounded to two decimal places;
- $Eg_{dry,a}$  = auxiliary electricity consumption of the standard cotton programme at full load, in kWh and rounded to two decimal places;
- $Eg_{dry\frac{1}{2},a}$  = auxiliary electricity consumption of the standard cotton programme at partial load, in kWh and rounded to two decimal places;
- $f_g = 2.5$ .

## 2. CALCULATION OF THE WEIGHTED CONDENSATION EFFICIENCY

The condensation efficiency of a programme is the ratio between the mass of moisture condensed and collected in the container of a condenser household tumble drier and the mass of moisture removed from the load by the programme, the latter being the difference between the mass of the wet test load before drying and the mass of the test load after drying. For calculating the weighted condensation efficiency, the average condensation efficiency of the standard cotton programme at both full and partial load is considered.

The weighted condensation efficiency ( $C_t$ ) of a programme is calculated as a percentage and rounded to the nearest whole percent as:

$$C_t = (3 \times C_{dry} + 4 \times C_{dry\frac{1}{2}})/7$$

where:

- $C_{dry}$  = average condensation efficiency of the standard cotton programme at full load;
- $C_{dry\frac{1}{2}}$  = average condensation efficiency of the standard cotton programme at partial load.

The average condensation efficiency  $C$  is calculated from the condensation efficiencies of test runs and expressed as a percentage:

$$C = \frac{1}{(n-1)} \sum_{j=2}^n \left( \frac{W_{wj}}{W_i - W_f} \times 100 \right)$$

where:

- $n$  is the number of test runs, comprising at least four valid test runs for the selected programme;
- $j$  is the test run number;
- $W_{wj}$  is the mass of water collected in the condenser reservoir during test run  $j$ ;
- $W_i$  is the mass of the wet test load before drying;
- $W_f$  is the mass of the test load after drying.

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

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 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 methods, and whose results are deemed to be of low uncertainty.

For the purposes of checking conformity with the requirements laid down in Annex I, Member State authorities shall test a single household tumble drier. If the measured parameters do not meet the values declared in the technical documentation file within the meaning of Article 4(2) by the manufacturer within the ranges set out in Table 1, the measurements shall be carried out on three more household tumble driers. The arithmetic mean of the measured values of those three household tumble driers shall meet the requirements within the ranges set out in Table 1.

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

**Table 1**

Measured parameter	Verification tolerances
Weighted annual energy consumption	The measured value shall not be greater than the rated value* of $AE_C$ by more than 6%.
Weighted energy consumption	The measured value shall not be greater than the rated value of $E_t$ by more than 6%.
Weighted condensation efficiency	The measured value shall not be less than the rated value of $C_t$ by more than 6%.
Weighted programme time	The measured value shall not be longer than the rated values of $T_t$ by more than 6%.
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 6%. 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 the left-on mode	The measured value shall not be longer than the rated value of $T_l$ by more than 6%.

\* 'rated value' means a value that is declared by the manufacturer. The 6% uncertainty in the measurement represent the current acceptable testing laboratory error in measuring the declared parameters with the new measurement method used for the new labelling/ecodesign requirements including full and partial load cycles.

## ANNEX IV Benchmarks

At the time of entry into force of this Regulation, the best available technology on the market for household tumble driers, in terms of their energy consumption and airborne acoustical noise emissions during drying for the standard cotton programme, is identified as follows:

- (1) Air-vented household tumble drier with a rated capacity of 3 kg:
  - (a) energy consumption: 1.89 kWh/cycle for the standard cotton cycle at full load, equal to about 247 kWh/year\*;
  - (b) airborne acoustical noise emissions: 69 dB.
- (2) Air-vented household tumble drier with a rated capacity of 5 kg:
  - (a) energy consumption: 2.70 kWh/cycle for the standard cotton cycle at full load, equal to about 347 kWh/year\*;
  - (b) airborne acoustical noise emissions: not available.
- (3) Gas fired air-vented household tumble driers with a rated capacity of 5 kg:
  - (a) Gas energy consumption: 3.25 kWh<sub>Gas</sub>/cycle equivalent to 1.3 kWh for the standard cotton cycle at full load. Annual energy consumption not available.
  - (b) airborne noise emissions: not available.
- (4) Condenser household tumble drier with a rated capacity of 5 kg:
  - (a) energy consumption: 3.10 kWh/cycle for the standard cotton cycle at full load, equal to about 396 kWh/year\*;
  - (b) airborne acoustical noise emissions: not available.
- (5) Air-vented household tumble drier with a rated capacity of 6 kg:
  - (a) energy consumption: 3.84 kWh/cycle for the standard cotton cycle at full load, equal to about 487 kWh/year\*;
  - (b) airborne acoustical noise emissions: 67 dB.
- (6) Condenser household tumble drier with a rated capacity of 6 kg:
  - (a) energy consumption: 1.58 kWh/cycle for the standard cotton cycle at full load, equal to about 209 kWh/year\*;
  - (b) airborne acoustical noise emissions: not available.
- (7) Air-vented household tumble drier with a rated capacity of 7 kg:
  - (a) energy consumption: 3.9 kWh/cycle for the standard cotton cycle at full load, equal to about 495 kWh/year\*;

- (b) airborne acoustical noise emissions: 65 dB.
- (8) Gas fired air-vented household tumble driers with a rated capacity of 7 kg:
- (a) Gas energy consumption: 3.4 kWh<sub>Gas</sub>/cycle equivalent to 1.36 kWh for the standard cotton cycle at full load. Annual energy consumption not available.
  - (b) airborne noise emissions: not available
- (9) Condenser household tumble drier with a rated capacity of 7 kg:
- (a) energy consumption: 1.6 kWh/cycle for the standard cotton cycle at full load, equal to about 211 kWh/year\*;
  - (b) airborne acoustical noise emissions: 65 dB.
- (10) Air-vented household tumble drier with a rated capacity of 8 kg:
- (a) energy consumption: 4.1 kWh/cycle for the standard cotton cycle at full load, equal to about 520 kWh/year\*;
  - (b) airborne acoustical noise emissions: 65 dB.
- (11) Condenser household tumble drier with a rated capacity of 8 kg:
- (a) energy consumption: 2.30 kWh/cycle for the standard cotton cycle at full load, equal to about 297 kWh/year\*;
  - (b) airborne acoustical noise emissions: not available.

\* calculated assuming 160 drying cycles per year with an energy consumption for the standard cotton programme at partial load equal to 60% of the energy consumption at full load, and an additional annual energy consumption in low power modes of 13.5 kWh.