



EUROPEAN COMMISSION

Brussels,
C(2011) yyy final

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

of

**supplementing Directive 2010/30/EU of the European Parliament and of the Council
with regard to energy labelling of household tumble driers**

(Text with EEA relevance)

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

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supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of 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 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products¹, and in particular Article 10 thereof,

Whereas:

- (1) Directive 2010/30/EU requires the Commission to adopt delegated acts for the labelling of energy-related products representing significant potential for energy savings and presenting a wide disparity in performance levels with equivalent functionality.
- (2) Provisions for the energy labelling of household tumble driers were established by Commission Directive 95/13/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric tumble driers².
- (3) The energy used by household tumble driers accounts for a significant part of total household energy demand in the Union. In addition to the energy efficiency improvements already achieved, the scope for further reducing the energy consumption of household tumble driers is substantial.
- (4) Commission Directive 95/13/EC should be repealed and new provisions should be laid down by this Regulation in order to ensure that the energy label provides dynamic incentives for suppliers to further improve the energy efficiency of household tumble driers and to accelerate market transformation towards energy-efficient technologies.
- (5) Household combined washer-driers are addressed in Commission Directive 96/60/EC of 19 September 1996 implementing Council Directive 92/75/EEC with regard to

¹ OJ L 153, 18.6.2010, p. 1.

² OJ L 136, 21.6.1995, p. 28.

energy labelling of household combined washer-driers³. They have particular characteristics and should therefore be exempted from the scope of this Regulation.

- (6) The information provided on the label should be obtained through reliable, accurate and reproducible measurement procedures 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 services⁴.
- (7) This Regulation should specify a uniform design and content for the label for household tumble driers, including gas-fired driers.
- (8) In addition, this Regulation should specify requirements as to the "technical documentation" and the "product fiche" for household tumble driers.
- (9) Moreover, this Regulation should specify requirements as to the information to be provided for any form of distance selling and advertisement of household tumble driers and any form of technical promotional material for such appliances.
- (10) It is appropriate to provide for a review of this Regulation in order to take into account technological progress.
- (11) In order to facilitate the transition from Directive 95/13/EC to this Regulation, household tumble driers labelled in accordance with this Regulation should be considered as compliant with Directive 95/13/EC.
- (12) Directive 95/13/EC should therefore be repealed.

HAS ADOPTED THIS REGULATION:

Article 1
Subject matter and scope

1. This Regulation establishes requirements for the labelling of and the provision of supplementary product information on 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.

³ OJ L 266, 18.10.1996, p. 1.

⁴ OJ L 204, 21.7.1998, p. 37.

Article 2
Definitions

In addition to the definitions laid down in Article 2 of Directive 2010/30/EU, the following definitions shall apply for the purposes 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 supplier 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 supplier 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 supplier’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 supplier'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) 'end-user' means a consumer buying or expected to buy a household tumble drier;
- (19) 'point of sale' means a location where household tumble driers are displayed or offered for sale, hire or hire-purchase.

Article 3
Responsibilities of suppliers

Suppliers shall ensure that:

- (a) each household tumble drier is supplied with a printed label in the format and containing the information set out in Annex I;
- (b) a product fiche, as set out in Annex II, is made available;
- (c) technical documentation as set out in Annex III is made available on request to the authorities of the Member States and to the Commission;
- (d) any advertisement for a specific model of household tumble drier contains the energy efficiency class, if the advertisement discloses energy-related or price information;
- (e) any technical promotional material concerning a specific model of household tumble drier which describes its specific technical parameters includes the energy efficiency class of that model.

Article 4
Responsibilities of dealers

Dealers shall ensure that:

- (a) each household tumble drier, at the point of sale, bears the label provided by suppliers in accordance with Article 3(a) on the outside of the front or top of the household tumble drier, in such a way as to be clearly visible;
- (b) household tumble driers offered for sale, hire or hire-purchase where the end-user cannot be expected to see the product displayed, as specified in Article 7 of Directive 2010/30/EU, are marketed with the information provided by suppliers in accordance with Annex IV to this Regulation;
- (c) any advertisement for a specific model of household tumble drier contains a reference to the energy efficiency class, if the advertisement discloses energy-related or price information;
- (d) any technical promotional material concerning a specific model of household tumble drier which describes its specific technical parameters includes a reference to the energy efficiency class of that model.

Article 5
Measurement methods

The information to be provided under Articles 3 and 4 shall be obtained by reliable, accurate and reproducible measurement procedures, which take into account the recognised state-of-the-art measurement methods.

Article 6
Verification procedure for market surveillance purposes

Member States shall apply the procedure set out in Annex V for assessing the conformity of the declared energy efficiency class, the energy consumption per cycle, the condensation efficiency class where applicable, the rated capacity, the power consumption in off-mode and left-on mode, the duration of the left-on mode, the programme time and airborne acoustical noise emissions.

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. The review shall in particular assess the verification tolerances set out in Annex V.

Article 8
Repeal

Directive 95/13/EC shall be repealed from [date to be inserted: 12 months after the entry into force of this Regulation].

Article 9
Transitional provisions

1. Article 3(d) and (e) and Article 4(b), (c) and (d) shall not apply to printed advertisements and printed technical promotional material published before [date to be inserted: 16 months after the entry into force of the Regulation].
2. Household tumble driers placed on the market before [date to be inserted: 12 months after the entry into force of the Regulation] shall comply with the provisions of Directive 95/13/EC.
3. Household tumble driers which comply with the provisions of this Regulation and which are placed on the market or offered for sale, hire or hire-purchase before [date to be inserted: 12 months after entry into force of the Regulation] shall be regarded as complying with the requirements of Directive 95/13/EC.

Article 10
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: 12 months after entry into force of the Regulation]. However, Article 3(d) and (e) and Article 4(b), (c) and (d) shall apply from [date to be inserted: 16 months after the entry into force of the Regulation].

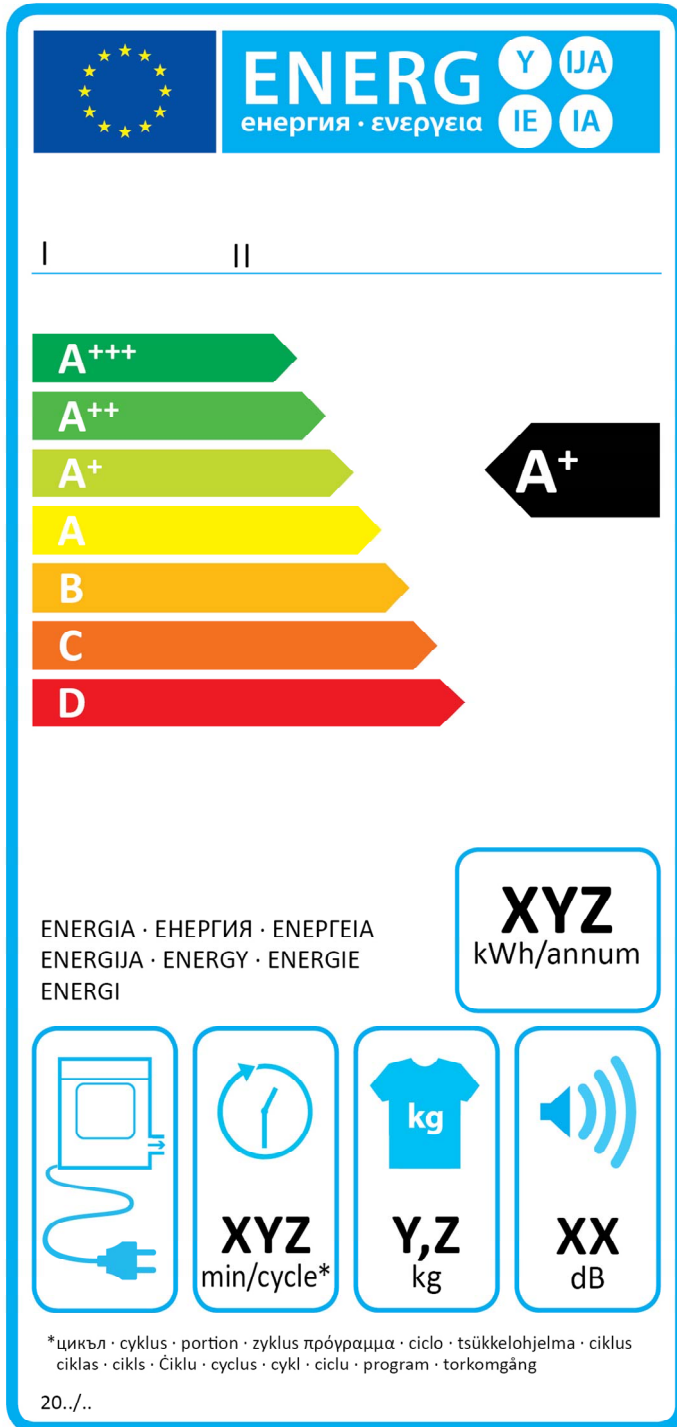
This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, [...]

For the Commission
The President

ANNEX I
Label

1. LABEL FOR AIR-VENTED HOUSEHOLD TUMBLE DRIER



I
II

III

IV

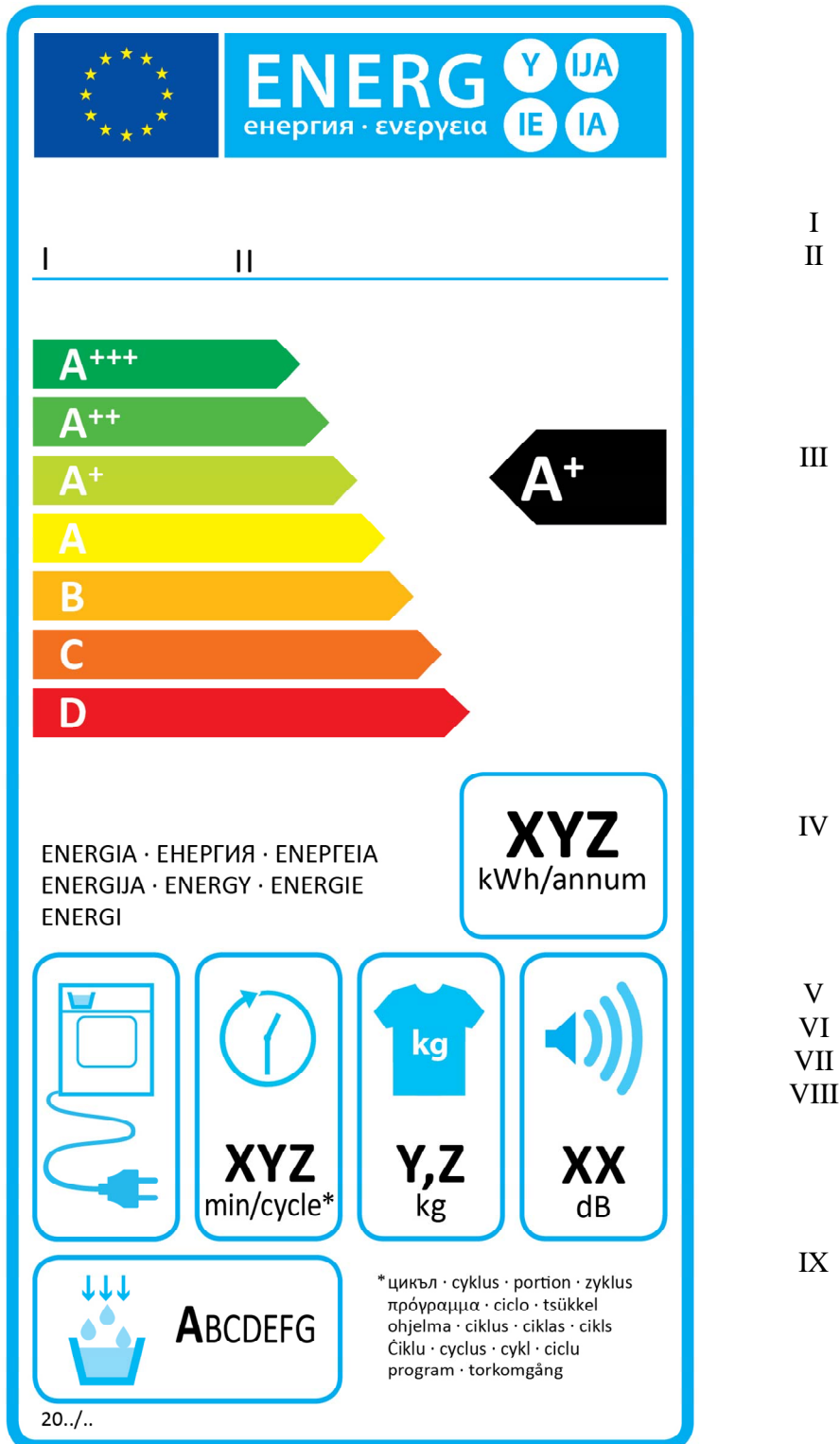
V
VI
VII
VIII

[* Numbering of the Regulation to be added on the label before publication in the OJ]

- (1) The following information shall be included in the label for air vented household tumble driers:
- I. supplier's name or trade mark;
 - II. supplier's model identifier, meaning the code, usually alphanumeric, which distinguishes a specific household tumble drier model from other models with the same trade mark or supplier's name;
 - III. the energy efficiency class as defined in point 1 of Annex VI; the head of the arrow containing the energy efficiency class of the household tumble drier shall be placed at the same height as the head of the arrow of the relevant energy efficiency class;
 - IV. weighted annual energy consumption (AE_C) in kWh/year, rounded up to the nearest integer and calculated in accordance with Annex VII;
 - V. information on the type of household tumble drier;
 - VI. cycle time corresponding to the standard cotton programme at full load in minutes and rounded to the nearest minute;
 - VII. rated capacity, in kg, for the standard cotton programme at full load;
 - VIII. airborne acoustical noise emissions, during the drying phase, for the standard cotton programme at full load, expressed in dB(A) re 1 pW, rounded to the nearest integer.
- (2) The design of the label for air vented household tumble driers shall be in accordance with point 4 of this Annex. Where a model has been granted an 'EU Ecolabel' under Regulation (EC) No 66/2010 of the European Parliament and of the Council⁵, a copy of the EU Ecolabel may be added.

⁵ OJ L 27, 30.1.2010, p. 1.

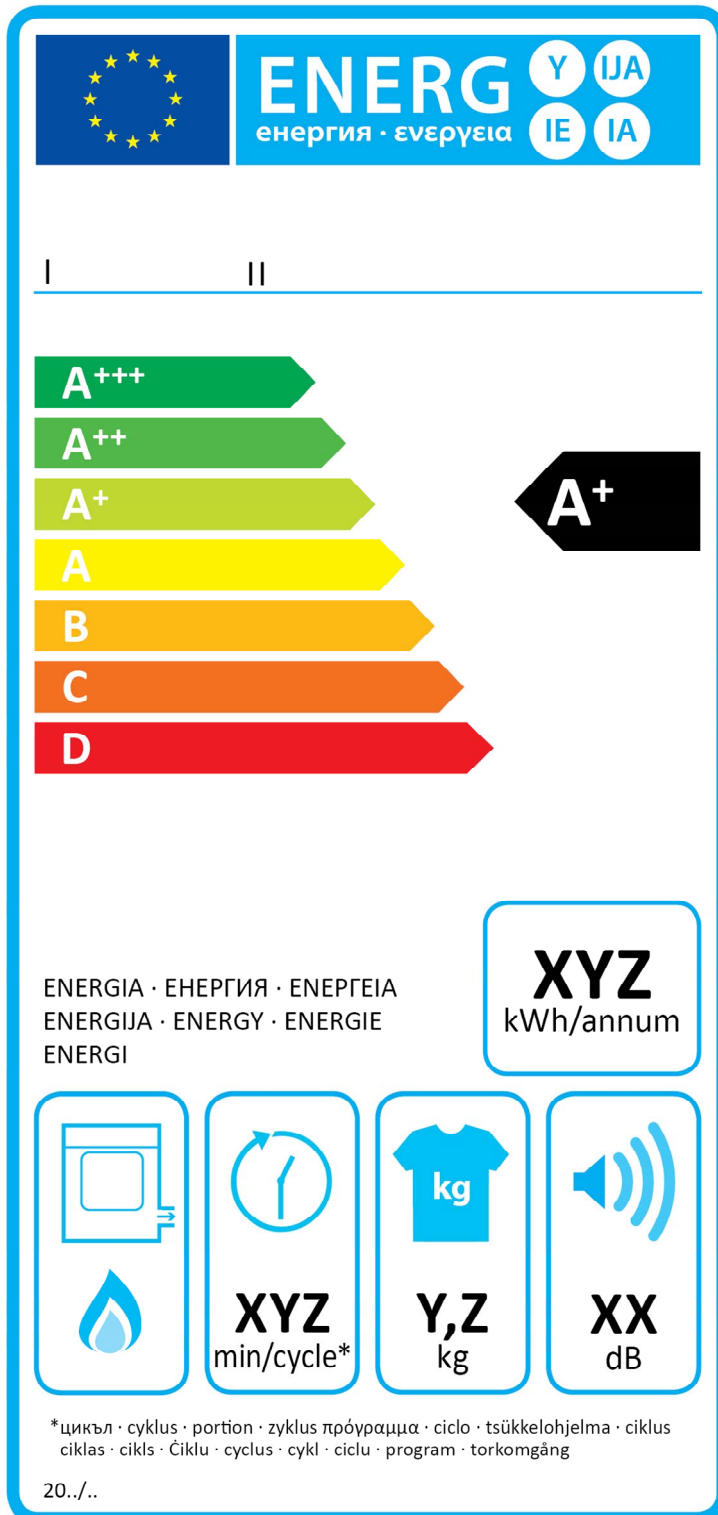
2. LABEL FOR CONDENSER HOUSEHOLD TUMBLE DRIER



[* Numbering of the Regulation to be added on the label before publication in the OJ]

- (1) In addition to the information listed in point 1(1), the label for condenser household tumble driers shall include:
 - IX. the condensation efficiency class in accordance with point 2 of Annex VI.
- (2) The design of the label for condenser household tumble driers shall be in accordance with point 4 of this Annex. Where a model has been awarded an 'EU Ecolabel' under Regulation (EC) No 66/2010, a copy of the EU Ecolabel may be added.

3. LABEL FOR GAS-FIRED HOUSEHOLD TUMBLE DRIER



I
II

III

IV

V
VI
VII
VIII

[* Numbering of the Regulation to be added on the label before publication in the OJ]

- (1) The information listed in point 1(1) shall be included in the label for gas fired household tumble driers.
- (2) The design of the label for gas fired household tumble driers shall be in accordance with point 4 of this Annex. Where a model has been awarded an 'EU Ecolabel' under Regulation (EC) No 66/2010, a copy of the EU Ecolabel may be added.

4. LABEL DESIGN

[Printing specification of the label to be added before publication in the OJ]

ANNEX II
Product Fiche

1. The information in the product fiche of household tumble driers shall be given in the following order and shall be included in the product brochure or other literature provided with the product:
 - (a) supplier's name or trade mark;
 - (b) supplier's model identifier, which means the code, usually alphanumeric, which distinguishes a specific household tumble drier model from other models with the same trade mark or supplier's name;
 - (c) rated capacity in kg of cotton for the standard cotton programme at full load;
 - (d) whether the household tumble drier is an air-vented, condenser or gas-fired household tumble drier;
 - (e) energy efficiency class in accordance with point 1 of Annex VI;
 - (f) the weighted Annual Energy Consumption (AE_c) rounded up to one decimal place; it shall be described as: 'Energy consumption "X" kWh per year, based on 160 drying cycles of the standard cotton programme at full and partial load, and the consumption of the low-power modes. Actual energy consumption per cycle will depend on how the appliance is used.';
 - (g) whether the household tumble drier is an 'automatic tumble drier' or 'non-automatic tumble drier';
 - (h) where the household tumble drier has been awarded an 'EU Ecolabel award' under Regulation (EC) No 66/2010, this information may be included;
 - (i) the energy consumption (E_{dry} , $E_{dry/2}$, $E_{g_{dry}}$, $E_{g_{dry/2}}$, $E_{g_{dr,a}}$, $E_{g_{dry/2,a}}$) of the standard cotton programme at full and partial load;
 - (j) the power consumption of the off-mode (P_o) and of the left-on mode (P_l) for the standard cotton programme at full load;
 - (k) if the household tumble drier is equipped with a power management system, the duration of the 'left-on mode',
 - (l) indication that the 'standard cotton programme' used at full and partial load is the standard drying programme to which the information in the label and the fiche relates, that this programme is suitable for drying normal wet cotton laundry and that it is the most efficient programme in terms of energy consumption for cotton;
 - (m) the weighted programme time (T_t) of the 'standard cotton programme at full and partial load' in minutes and rounded to the nearest minute as well as the programme time of the 'standard cotton programme at full load' (T_{dry}) and the programme time of the 'standard cotton programme at partial load' ($T_{dry/2}$) in minutes and rounded to the nearest minute;

- (n) if the household tumble drier is a condenser tumble drier, the condensation efficiency class in accordance with point 2 of Annex VI, expressed as ‘condensation efficiency class “X” on a scale from G (least efficient) to A (most efficient)’; this may be expressed by other means provided it is clear that the scale is from G (least efficient) to A (most efficient);
 - (o) if the household tumble drier is a condenser tumble drier, the average condensation efficiency C_{dry} and $C_{dry\frac{1}{2}}$ of the standard cotton programme at full load and partial load and the weighted condensation efficiency (C_i) for the ‘standard cotton programme at full and partial load’, as a percentage and rounded to the nearest whole percent;
 - (p) airborne acoustical noise emissions expressed in dB(A) re 1 pW and rounded to the nearest integer for the standard cotton programme at full load;
 - (q) if the household tumble drier is intended to be built-in, an indication to this effect.
2. One product fiche may cover a number of household tumble drier models supplied by the same supplier.
 3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 1 not already displayed on the label shall also be provided.

Annex III
Technical documentation

1. The technical documentation referred to in Article 3(c) shall include:
 - (a) the name and address of the supplier;
 - (b) a general description of the tumble drier model, sufficient for it to be unequivocally and easily identified;
 - (c) where appropriate, the references of the harmonised standards applied;
 - (d) where appropriate, the other technical standards and specifications used;
 - (e) the identification and signature of the person empowered to bind the supplier;
 - (f) technical parameters for measurements as follows:
 - (i) the energy consumption (E_{dry} , $E_{dry\frac{1}{2}}$, $E_{g_{dry}}$, $E_{g_{dry\frac{1}{2}}}$, $E_{g_{dr,a}}$, $E_{g_{dry\frac{1}{2},a}}$) of the standard cotton programme at full and partial load,
 - (ii) power consumption in ‘off-mode’ and the power consumption in ‘left-on mode’,
 - (iii) the programme time of the ‘standard cotton programme at full load’ (T_{dry}) and the programme time of the ‘standard cotton programme at partial load’ ($T_{dry\frac{1}{2}}$), in minutes and rounded to the nearest minute,
 - (iv) if the household tumble drier is equipped with a power management system, the duration of the ‘left-on mode’,
 - (v) if the household tumble drier is a condenser tumble drier, the average condensation efficiency C_{dry} of the standard cotton programme at full load and the average condensation efficiency of the standard cotton programme at partial load $C_{dry\frac{1}{2}}$,
 - (vi) the airborne acoustical noise emissions;
 - (g) the results of calculations performed in accordance with Annex VII.
2. 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 documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by suppliers to verify the accuracy of the calculations undertaken. The information shall also include a list of all other equivalent household tumble drier models where the information was obtained in the same way.

ANNEX IV

Information to be provided in cases where end-users cannot be expected to see the product displayed

1. The information referred to in Article 4(b) shall be provided in the following order:
 - (a) the rated capacity in kg of cotton, for the standard cotton programme at full load;
 - (b) whether the household tumble drier is an air-vented, condenser or gas-fired household tumble drier;
 - (c) the energy efficiency class as defined in point 1 of Annex VI;
 - (d) the weighted Annual Energy Consumption (AE_c) rounded up to the nearest integer, to be described as: ‘Energy consumption “X” kWh per year, based on 160 drying cycles of the standard cotton programmes at full and partial load, and the consumption of the low-power modes. Actual energy consumption per cycle will depend on how the appliance is used.’;
 - (e) whether the household tumble drier is an ‘automatic tumble drier’ or ‘non-automatic tumble drier’;
 - (f) the energy consumption (E_{dry} , $E_{dry/2}$, $E_{g_{dry}}$, $E_{g_{dry/2}}$, $E_{g_{dr,a}}$, $E_{g_{dry/2,a}}$) of the standard cotton programme at full and partial load, rounded up to two decimal places and calculated in accordance with Annex VII;
 - (g) the power consumption of the off-mode (P_o) and the left-on mode (P_l) for the standard cotton programme at full load;
 - (h) the programme time of the ‘standard cotton programme at full load’ (T_{dry}) and the programme time of the ‘standard cotton programme at partial load’ ($T_{dry/2}$), in minutes and rounded to the nearest minute, calculated in accordance with Annex VII;
 - (i) if the household tumble drier is a condenser tumble drier, the condensation efficiency class in accordance with point 2 of Annex VI;
 - (j) airborne acoustical noise emissions for the standard cotton programme at full load, expressed in dB(A) re 1 pW and rounded to the nearest integer;
 - (k) if the household tumble drier is intended to be built-in, an indication to this effect.
2. Where other information contained in the product fiche is also provided, it shall be in the form and order specified in Annex II.
3. The size and font in which all the information referred in this Annex is printed or shown shall be legible.

ANNEX V

Verification procedure for market surveillance purposes

For the purposes of checking conformity with the requirements laid down in Articles 3 and 4, Member State authorities shall test a single household tumble drier. If the measured parameters do not meet the values declared by the supplier 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 values declared by the supplier within the ranges defined 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 Articles 3 and 4.

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
Weighted annual energy consumption	The measured value shall not be greater than the rated value* of AE_C by more than 10%.
Weighted energy consumption	The measured value shall not be greater than the rated value of E_t by more than 10%.
Weighted condensation efficiency	The measured value shall not be less than the rated value of C_t by more than 10%.
Weighted programme time	The measured value shall not be longer than the rated values of 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 the left-on mode	The measured value shall not be longer than the rated value of T_{lu} by more than 10%.
Airborne acoustical noise emissions	The measured value shall not be greater than the rated value.

* 'rated value' means a value that is declared by the supplier. The 10% 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 VI
Energy efficiency classes and condensation efficiency classes

1. ENERGY EFFICIENCY CLASSES

The energy efficiency class of a household tumble drier shall be determined on the basis of its Energy Efficiency Index (*EEI*) as set out in Table 1.

The Energy Efficiency Index (*EEI*) of a household tumble drier shall be determined in accordance with point 1 of Annex VII.

Table 1: Energy efficiency classes

Energy efficiency class	Energy Efficiency Index
A+++ (most efficient)	$EEI < 35$
A++	$35 \leq EEI < 43$
A+	$43 \leq EEI < 53$
A	$53 \leq EEI < 65$
B	$65 \leq EEI < 76$
C	$76 \leq EEI < 85$
D (least efficient)	$85 \leq EEI$

2. CONDENSATION EFFICIENCY CLASSES

The condensation efficiency class of a household condenser tumble drier shall be determined on the basis of the weighted condensation efficiency (C_t) as set out in Table 2.

The weighted condensation efficiency (C_t) of a household condenser tumble drier shall be determined in accordance with point 2 of Annex VII.

Table 2: Condensation efficiency classes

Condensation efficiency class	Weighted condensation efficiency
A (most efficient)	$C_t > 90$
B	$80 < C_t \leq 90$
C	$70 < C_t \leq 80$
D	$60 < C_t \leq 70$
E	$50 < C_t \leq 60$
F	$40 < C_t \leq 50$
G (least efficient)	$C_t \leq 40$

ANNEX VII
Method for calculating the Energy Efficiency Index and the 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 household air-vented 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):

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

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:

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

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 and 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 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 load before drying and the mass of the test load after drying. For calculating the weighted condensation efficiency, the average condensation efficiency for 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:

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

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.