

WORKING DOCUMENT
ON A POSSIBLE COMMISSION DIRECTIVE
IMPLEMENTING COUNCIL DIRECTIVE 92/75/EC WITH REGARD TO
HOUSEHOLD WASHING MACHINES

Explanatory Notes

Rationale of the draft directive

Scope

The purpose of the directive is to set a revised labelling scheme on the energy efficiency and other aspects of electric mains operated household washing machines with the aim to reduce the related energy consumption (as required in Directive 95/75/EEC). The directive applies also when appliances are sold for non-household uses.

In order to cope with the very different amount of laundry that machines can treat in a washing cycle this directive, which is based on the preparatory study on domestic washing machines and dishwashers developed in the framework of the ecodesign directive 2005/32/EC, uses a common functional unit represented by the machine rated capacity which identifies the “service” given to the consumer.

Relation with product specific and "horizontal" ecodesign IMs

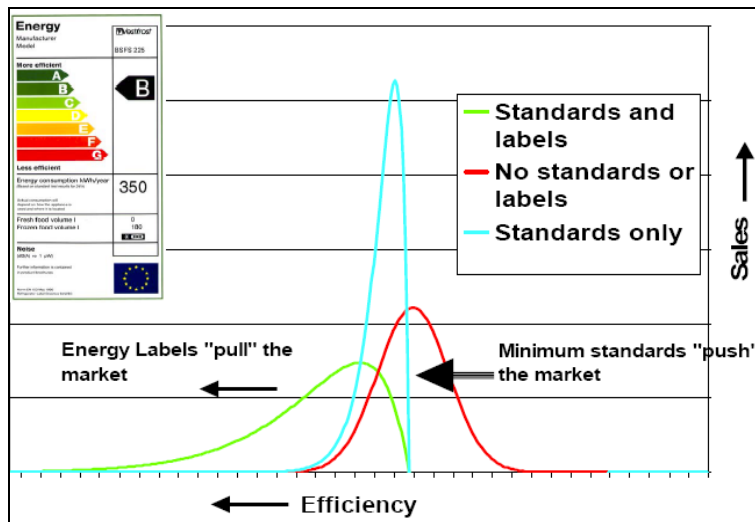
This product specific directive has a relation with the horizontal standby power consumption Regulation, since it deals with two low power modes, namely ‘off mode’ and ‘left on mode’. It is a common understanding, supported by the results of the preparatory study, that in washing machines the off mode includes active sensor based protection function(s) to protect the user for example from accidental water leakage. The active presence of such function(s) is promoted in this IM to insure the highest level of consumer protection. The ‘left on mode’ is more typical of wash appliances and indicates the status when the programme has terminated and the machine has been unloaded but not switched off by a user intervention or automatically; again sensor based protection function(s) are active.

This directive shares the same algorithm developed for the ecodesign Regulation on washing machines, which considers the overall annual energy consumption including the energy consumption of the two most important low power modes (the “off mode” and “left on mode”). If no protection function(s) is active, then the standby Regulation applies and the two modes are contemporarily subject to the specific requirements of the standby Regulation and considered in the overall annual energy consumption of washing machines under this directive.

The measurement method referred into the standby Regulation is the basis for the evaluation of the duration and the power consumption of the two modes.

Relation with other energy efficiency policy measures

An effective coordination is necessary between this directive and the ecodesign implementing measure (under framework directive 2005/32/EC) for washing machines. It is the intention that the two policies will share not only the basic definitions but also the algorithms for the calculation of the Energy Efficiency Index. In addition, the coordination of the dynamic steps and time horizon of the two policy measures will insure a synergic effect of the pushing effect of the eco-design specific requirements and the pulling effect of the new labelling energy efficiency scale, according to the qualitative but well experienced relation¹:



Labelling requirements

Appliance classification: washing machines are identified through their rated capacity that is the maximum mass in kg of dry textiles which the manufacturer declares can be treated in the machine in the programme selected. In the context of this directive the ‘dry textile’ is cotton and the programme is either the standard 60°C cotton or the standard 40°C cotton programme.

Energy efficiency ranking and class specifications: the Energy Efficiency Index is used to specify an energy efficiency ranking divided into 10 levels going from 1 (less efficient) to 10 (most efficient). Contemporarily, energy efficiency classes from G to A are also defined for continuity with the current labelling scheme and to inform consumer about the energy efficiency range of existing products during the specific validity period of the label. The period of the validity of the label is the interval between the year of beginning and of expiring of each step, in the form ‘20XX-20XX’.

Label specifications: in addition to the energy efficiency ranking and energy efficiency class, information about machine capacity, annual energy and water consumption (on the basis of 220 washing cycles), spin drying efficiency, noise, and possible presence of the eco-label are included in the label layout.

¹ IEA, P. Waide, International use of policy instruments: country comparisons, Copenhagen, 05 April 2006.

Fiche specifications: are set in terms of information to be included in addition to those already present in the label: programme time, maximum spin speed and the built-in construction.

Other communication: information to be delivered where appliances are offered for sales by means which imply that the potential customer cannot be expected to see them displayed.

Energy labelling timing and revision

The label is set in two stages: Step 1, to be implemented one year after the entry into force of the directive, Step 2 to be implemented six years after the entry into force of the directive. It is recommended that the two Steps correspond as much as possible with the two phase phase-out of less efficient washing machines via the ecodesign Regulation on household washing machines.

The one year transition period after entry into force encompassed in the first Step should allow industry to prepare the declarations, the labels and the communications for all appliances.

Revision

It is planned to examine the necessity to revise the measure at the latest 7 years after adoption, that is after the second Step will be implemented. This revision should be possibly developed in parallel with the revision of the above mentioned ecodesign Regulation on household washing machines.

Rationale for the mandatory labelling

The aim is to improve the environmental impact of washing machines through a mandatory two step labelling scheme based on an energy efficiency index related to the overall annual energy consumption including the most important low power modes. An effective co-ordination with the specific requirements on energy efficiency set in the ecodesign Regulation for the same product group is recommended to achieve a synergy between the two policy measures.

The use phase is addressed through the energy efficiency rating and the declaration of the overall annual energy and water consumption in the label. The LCA (life cycle analysis) performed for the ecodesign preparatory study demonstrated that, despite the significant achieved energy efficiency improvement and water savings, the use phase is still responsible for most of the environmental impact of this product due to the energy and water consumption.

The proposed labelling adopts a unique **energy efficiency** ranking for all washing machines, independent from their rated capacity, in order to catch the maximum improvement potential and a substantial energy savings in the EU. This is possible since the standard annual energy consumption which is the basis for the EEI calculation is defined as a linear function of the capacity.

In today's machines the **water consumption** in the (warm) washing phase is already minimised, due to the associated energy consumption, therefore the water savings can

be done mainly in the other washing phases essentially in rinsing. A strong correlation does exist between water consumption and rinsing performance, as demonstrated by several studies developed worldwide. Despite all efforts and research mainly in Europe, USA and Australia no accurate method for assessing the rinsing performance is available yet. The alkalinity method, to be included in the new standard IEC 60456 5th edition, still presents a too large uncertainty of the results. Without the assessment of the rinsing performance the setting of a water efficiency ranking could easily result in poor rinsing. Machines on the EU market present already the possibility of extra rinse(s), recommended by manufacturers for people with particularly sensitive skin or babies or in some cases even when the machine is used at full load. The water consumption of washing machines is therefore addressed in this directive through the declaration of the annual consumption in litres, to make consumer aware of the amount of water used when washing laundry at home.

Verification procedure for market surveillance purposes

European standard EN 60456 describes a two-stage verification procedure which is used for the EU labelling scheme. This staged procedure is acceptable for the verification of this IM, but the values of the measurement uncertainty include the production variability, which is today considered as part of the overall equipment quality and therefore under manufacturers' responsibility, while the reproducibility of the measurement method and the variability in testing shall remain under the responsibility of standardisation bodies and testing laboratories.

The verification procedure for this directive foresees a set of lower values than in the EN standard for the uncertainty of the energy consumption and the other parameters for the verification process, to be confirmed on the basis of the results of the inter-laboratory round robin test on washing machines on-going at EU and worldwide level on the new 5th edition of the IEC (and future EN) 60456. For the moment a 10% measurement uncertainty has been established for the energy consumption for a single product while requiring that the average of the product sample under test (three more units) has to meet the limit EEI value with the same 10% uncertainty. The uncertainty values of the other parameters are set following the same principle of reduction of the measurement uncertainty. Only for the washing performance index a higher measurement uncertainty (4%) than in the current EN standard was defined on the basis of the latest available round robin test results.

This approach will avoid that a washing machine model declared in one energy efficiency class is then found as belonging to two classes less due to the measurement uncertainty in the verification.

This procedure will remain valid until a suitable harmonised standard is prepared by the relevant ESOs under a specific mandate issued by the Commission after the consultation with Member States and stakeholders.

Detailed explanation of the directive

Chapter 1: the scope of the directive is described, to cover electric mains operated automatic household washing machines, also when they are sold for non-household use.

The scope is then refined through some exemptions which exclude appliances without spin capability and those which can use other energy sources. Washer-dryers are also excluded from the scope.

Chapter 2: definitions are provided for the terms used in the requirements set out in the Annexes. Some definitions have been set to complement those in current edition of EN 60456, the reference standard for washing machines in Europe. Automatic washing machines are defined as machines where the load is fully treated by the machine without the need for user intervention at any point during the programme prior to its completion. Examples of user intervention could include manual fill (non automatic water level), transfer of the load between a washing drum and a spin extractor drum or manual draining.

Definition are also given for the most important low power modes, the ‘off mode’ and the ‘left-on mode’, as in the coming new IEC 60456 5th Ed./EN 60456.

Chapter 3: sets the elements to be included in the necessary technical documentation referred to in Article 2 (3) of the framework Directive 92/75/EEC .

Chapter 4: the layout and content of the label is set with a reference to Annex II, which contain the actual layout (Part 1) and contents (Part 2). The printing details are described in Part 3.

Chapter 5: the content of the fiche referred to in the third indent of Article 2 (1) of Directive 92/75/EEC is set with a reference to Annex III, which contain the actual layout and contents.

Chapter 6: sets the other communication to be provided when the potential customer cannot be expected to see the appliance displayed but it is nevertheless offered for sale, hire or hire purchase by any paper or electronic mean, with a reference to Annex IV, which contain the actual layout and contents.

Chapter 7: sets the transitory period between the directive adoption and the application of the first Step of the label in the EU, along with the further transition period when the second Step is implemented: for three months Member States shall allow the circulation of appliances bearing the previous label.

Chapter 8: a verification procedure for market surveillance purposes already exists for washing machines set out in a harmonised standard (EN 60456), providing compliance with measurements under the washing machine energy label directives 95/12/EC and 96/89/EC. Through the provisions in this Chapter and in Annex V, the verification procedure covers the washing machines under the scope of this directive and is also made more rigorous by placing under the manufacturers’ responsibility the manufacturing process variability.

Chapter 9: the repeal of Directives 95/12/EC and 96/89/EC is necessary because the current labelling scheme is replaced by this new layout and requirements.

Chapter 10: the revision of the directive is foreseen no later than 7 years after its entry into force, which is just after to the implementing of the second step of the labelling, and possibly of the specific requirements of the parallel ecodesign Regulation on this

product group. This revision will evaluate the technological progress and the technical and economical feasibility of a further labelling for washing machines.

Chapter 11: the provisions for the adoption by the Member States are set in 12 months after the entry into force of the directive.

Chapters 12 and 13: deals with the entry into force and the addressee of the directive.

Annex I: sets out the energy efficiency ranking and the energy efficiency class. The energy efficiency rating is independent from the machine load capacity and is based on the Energy Efficiency Index, calculated as described in Annex VI. The energy efficiency ranking goes from 1 (less efficient) to 10 (more efficient). Each level corresponds to an equal effort of about 11-13% energy efficiency improvement.

The energy efficiency ranking is complemented (Table 1) by energy efficiency classes from G to A, deriving from the current labelling scheme and which describe the appliance energy efficiency range existing during the specific validity period of the label. The period of the validity of the label is the interval between the year of beginning and of expiring of each Step in the form '20XX-20XX'.

Also the spin drying efficiency ranking is set in a scale from 1 (low) to 7 (high) efficiency, corresponding to the same values of the remaining moisture content as in the current labelling scheme.

Annex II: sets the layouts of the label and the elements to be included in it along with the printing and design elements.

In **Part 1** the Label layout and timing are set. A two-step implementation of the labelling is foreseen, the first step one year after the enforcement of the directive, the second step five years later (i.e. six years after the enforcement of the directive). A part from the energy efficiency ranking and energy efficiency class, other elements in the layout are the machine rated capacity (in kg of cotton), the annual energy and water consumption calculated for 220 cycles, the spin drying efficiency and the noise in dB(A) in the washing and spinning phases of the washing cycle.

Part 2 of the Annex includes the explanatory notes to the different elements of the label. In particular for the washing machine capacity the manufacturer shall declare the the maximum mass in kg of dry cotton that can be treated in the standard 60°C cotton programme at full load or in the standard 40°C cotton programme at full load, whichever is lower, although the two capacities are very likely the same. The same will happen for the noise, the highest values for the washing and the spinning shall be declared.

In **Part 3** the design characteristics of the layout are described for the printing.

Annex III: sets the elements in the fiche. In addition to the elements already presented in the label the programme time, maximum spin speed, and the built-in construction should be included. For the programme time the longest, while for the maximum spin speed the lowest shall be declared of the values measured for the standard 60°C cotton programme and the standard 40°C cotton programme.

Annex IV: sets the other communications (essential information) mandatory when the appliance is advertised and offered for sale, hire or hire purchase to potential customers which are not expected to see the it displayed. Any printed or written communication, mail order catalogues and other printed communications, advertisements on the Internet or on other electronic media is included.

Annex V: contains provisions on the verification procedure to be applied by the Member States' authorities when performing market surveillance checks referred to in Directive 2005/32/EC, Article 3 (2), and until a suitable harmonised standard is published for the purpose of this Annex.

Annex VI: contains the method for calculating the Energy Efficiency Index (EEI), the annual energy and water consumption and the remaining moisture content of washing machines.

Part 1 contains the method for calculating the Energy Efficiency Index (EEI). The EEI is the ratio between the estimated annual energy consumption and the standard annual energy consumption of a washing machine with the same capacity, expressed as percentage. The estimated annual energy consumption is given by the sum of the weighted energy consumption of the seven runs for two washing programmes and two loads (3 runs for the standard 60°C cotton programme at full load + 2 runs for the standard 60°C cotton programme at partial load + 2 runs for the standard 40°C cotton programme at partial load) plus the estimated energy consumption of the two most important low power modes, the 'off mode' and the 'left on mode' for the same washing programme.

To calculate the overall annual consumption the knowledge of the use pattern of the washing machines is a prerequisite. In the current labelling scheme 220 washing cycles per year are considered in the calculation of informative annual energy consumption. This value has been maintained also in this directive since it has been substantially confirmed by the preparatory study, where on average a washing machine is used for about 4,86 times per week, or about 233 times per year when excluding 4 weeks holiday.

Once the duration (in minutes) of the three washing programmes is known (through a test using the EU standard) and has been weighted (according to the same 3+2+2 approach) the overall amount of time in a year spent for washing can be calculated. The remaining time is divided in two and each half is then allocated to each low power mode. This time multiplied by the power of each mode (again weighted average for the three washing programmes) gives the energy consumption in the two modes. The attribution of an equal amount of time to each of the two considered low power modes has been successfully used in other policy measures at international level. When a power management operates in the washing machine, automatically reverting the left on mode to off mode, also the time the machine remains in left on mode (weighted average for the three washing programmes) shall be measured, and the formula to be applied for the calculation of the overall annual consumption is slightly different.

This assumption will assure that whether sensor based protection function are activated in the low power modes, their energy consumption is kept to the real minimum, and when they are not present the power of low power modes is subject also to the standby Regulation requirements.

The use of the weighted (3+2+2) values of the standard 60°C and 40°C cotton programmes at full load and partial load is in line with the results of the preparatory study and is giving continuity with the current labelling scheme and the previous industry Voluntary Commitments which are all based on the standard 60°C cotton programme at full load. Averaging the answers of a survey on almost 2 500 consumers from 10 countries, the study found that there is a 37% preference for the 40°C programmes, while the second most used temperature is 60°C (23 %) and the 90 °C (7%). A dominance of the cotton programmes (cotton, linen, mixed) was also found with more than 50% of the consumers declaring that these programmes are used always or often. The 3+2+2 approach successfully represents also the highly energy consuming 90°C programme still used by consumers.

The Standard Annual Energy Consumption of washing machines is a linear function of the machine capacity, where the intercept and the angular coefficient derive from the regression of the washing machine models with 4,5-6,5 kg capacity in the 1997 database², matching the 5 kg machine base case identified by the previous studies³, and which was used as basis for the mentioned two rounds of the industry Voluntary Commitment on washing machines. This choice would allow to keep this directive in line with the previous policy measures.

Part 2 contains the method for calculating the weighted average annual water consumption (for the 3 runs for the standard 60°C cotton programme at full load + 2 runs for the standard 60°C cotton programme at partial load + 2 runs for the standard 40°C cotton programme at partial load) considering 220 cycles per year.

In **Part 3** the determination of the remaining moisture content is described, following the same weighing systems and washing programmes than for the energy and the water annual consumptions.

Part 4 specifies that the programmes used for the purposes of this directive shall be the same programmes used for the parallel ecodesign implementing measure under framework directive 2005/32/EC.

Part 5 states that until an harmonised standard for the measurement of the 60°C cotton and 40°C cotton programmes at full and partial load is available the alternative formulae described in Annex VII shall be used.

In Annex VII, alternative formulae – based on the well known standard 60°C cotton programme at full load - are indicated for a transitional period, in case a suitable harmonised standard including measurements for the 60°C and the 40°C cotton programmes at full and partial load, is not available when the first Step of this directive enters into force.

A mandate for the corresponding European harmonised standard will be issued to European standardisation bodies after the consultation of Member States.

Other elements in the proposed directive

² In 1997 the first technical database was developed by manufacturers' Association CECED to support the first Industrial Voluntary Commitment on reduction the energy consumption of washing machines. The database was given to the Commission and to National Authorities in the framework of the verification procedure.

³ Study for the Commission of the European Communities on Washing Machines, Dryers and Dishwashers, carried out by Group of Efficient Appliances (GEA), (Final Report, June 1995) and Sensitivity Analysis of Energy Efficiency Improvements for Washing Machines, carried out by Van Holsteijn en Kemna (NL), (Final report, April 1996)

Rounding is indicated for all calculation steps: the energy consumption of the programme (E_i) is rounded to the three decimal places, the annual energy consumption and the standard annual energy consumption are rounded to two decimal places, the EEI value is rounded to one place.

Noise is addressed in this directive in terms of its declaration for both the washing and the spinning phases. This approach is considered the most appropriate since the loudest noise occurs during the spinning phase, especially at the higher spinning speeds. The setting of any noise performance scale would negatively impact on the higher spinning speed machines which are sold in Nordic countries to be used in conjunction with dryers. The washing machines on the today market have an average noise at about 50/75 dB(A) in washing/spinning phases.

Estimated energy savings

The combined effect of the ecodesign implementing measure and of the new energy labelling scheme have been estimated in the preparatory study for the EU25 countries, compared to a reference BaU scenario foreseeing 100% of the models on market having an energy efficiency equivalent to the current A+ in 2020. For washing machines the achievable savings are in the order of about 2,6% (or 1,1 TWh) in 2020, to reach a maximum of about 6% (or 2,8 TWh) in 2030 when the best performing (and still not available in the market) washing technologies are expected to dominate the market.

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Chapter 1
Subject matter and scope

1. This Directive shall apply to electric mains operated automatic household washing machines even where these are sold for non-household uses.
2. The following appliances are excluded from the scope of this Directive:
 - washing machines with no spin capability;
 - combined washer-driers;
 - washing machines that can use fuels (such as LPG, kerosene, bio-diesel, etc.);
 - washing machines that are only battery operated.
3. The information required by this Directive shall be obtained by measurements made in accordance with harmonised standards adopted by the European Standardisation Bodies (CEN, CENELEC, ETSI) under mandate from the Commission in accordance with Directive 98/34/EC of the European Parliament and of the Council⁴, the reference numbers of which have been published in the Official Journal of the European Union and for which Member States have published the reference numbers of the national standards transposing those harmonised standards.

Chapter 2
Definitions

In this Directive the definitions set out in Article 1(4) of Directive 92/75/EEC shall apply. The following definitions shall also apply:

- a) “washing machine” means an appliance for cleaning and rinsing of textiles using water which may also have a means of extracting excess water from the textiles;
- b) “automatic washing machine” means a washing machine where the load is fully treated by the machine without the need for user intervention at any point during the programme prior to its completion. Examples of user intervention could include manual fill (non automatic water level), transfer of the load between a washing drum and a spin extractor drum or manual draining.
- c) “rated capacity” means the maximum mass in kg of dry textiles, at 0,5 kg intervals, which the manufacturer declares can be treated in the washing machine on the programme selected.

⁴ OJ L 344, 06.12.1986, p. 24.

- d) “capacity at partial load” means a half of the washing machine rated capacity.
- e) “off-mode’ is a condition where the product is switched off using appliance controls or switches that are accessible and intended for operation by the user during normal use to attain the lowest power consumption that may persist for an indefinite time while connected to a mains power source and used in accordance with the manufacturer’s instructions. Where there are no controls, the washing machine is left to revert to a steady state power consumption of its own accord.
- f) “left-on mode” is the lowest power consumption mode that may persist for an indefinite time after the completion of the programme and unloading of the machine without any further intervention of the user.
- g) “equivalent washing machine” means a model placed on the market with the same rated capacity, technical and performance characteristics, energy and water consumption and noise in washing and spinning of another model placed on the market under a different commercial code number by the same supplier.

Chapter 3 **Technical documentation**

1. The technical documentation referred to in Article 2 (3) of Directive 92/75/EEC shall include:
 - the name and address of the supplier,
 - a general description of the appliance, sufficient for it to be identified,
 - information, including drawings as relevant, on the main design features of the model and in particular items which appreciably affect its energy consumption,
 - reports of relevant measurement tests carried out under the standards referred to in Chapter 1 (3) of this Directive,
 - operating instructions, if any.

2. Where the information relating to a particular washing machine model has been obtained by calculation on the basis of design, and/or extrapolation from other equivalent or similar washing machines, the documentation should include details of such calculations and/or extrapolations, and of tests undertaken to verify the accuracy of the calculations undertaken (details of mathematical model for calculating performance and of measurements taken to verify this model). It shall also include a list of all other equivalent or similar washing machine models whose information has been obtained on the same basis.

Chapter 4 **The Label**

1. The label referred to in Article 2 (1) of Directive 92/75/EEC shall be as specified in **Annex II** to this Directive. It shall be placed on the outside of the front or top of the appliance, in such a way as to be clearly visible, and not obscured.

2. The energy efficiency ranking, energy efficiency class and spin drying efficiency ranking of a washing machine appliance shall be as specified in **Annex I**.

Chapter 5 **The Fiche**

The content and format of the fiche referred to in the third indent of Article 2 (1) of Directive 92/75/EEC shall be as specified in **Annex III** to this Directive.

Chapter 6 **Other communications**

Where the appliances are offered for sale, hire or hire purchase by means of a printed or written communication, or by other means which imply that the potential customer cannot be expected to see the appliance displayed, such as a written offer, a mail order catalogue, advertisements on the Internet or on other electronic media, that communication shall include all the information specified in **Annex IV** to this Directive.

Chapter 7 **Free circulation of washing machines**

Member States shall take all necessary measures to ensure that all suppliers and dealers established in their territory fulfil their obligations under this Directive.

Member States shall allow the circulation of labels, fiches and communications referred to in Chapters 3, 4, and 5 of this Directive, no later than [*one year and one day after the entry into force of this directive*].

They shall ensure that all labels, fiches and communications referred to in Chapters 4, 5, and 6 of this Directive comply with the models in Annexes II, III and IV, no later than [*one year and a half after the entry into force of this directive*].

For three months after the entering into force of the provisions in Annex II, Part 1, point b) of this Directive, Member States shall allow the display of labels referred to in Article 4 of this Directive complying with the provisions in Annex II, Part 1, point a).

Chapter 8 **Verification procedure for market surveillance purposes**

Member States shall take all necessary measures to ensure that all suppliers and dealers established in their territory fulfil their obligations under this Directive.

When performing the market surveillance checks referred to in Directive 2005/32/EC, Article 3 (2), Member State authorities shall apply the verification procedure set out in **Annex V** of this directive.

Chapter 9
Repeals

Directives 95/12/EC and 96/89/EC shall be repealed [one year] after the entry into force of this directive.

Chapter 10
Revision

No later than [7] years after entry into force of this Directive the Commission shall review it (including the annexes) in the light of technological progress and present the result of this review to the Committee set up under Article 10 of Directive 92/75/EEC and Article 19 of Directive 2005/32/EC.

Chapter 11
Adoption

Member States shall adopt and publish the provisions to comply with this Directive no later than [*one year after the entry into force of this directive*]. They shall immediately inform the Commission thereof.

When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

Chapter 12
Entry into force

This Regulation shall enter into force on the 20th day following that of its publication in the *Official Journal of the European Union*.

Chapter 13
Addressee

This Directive is addressed to the Member States.

Done at Brussels,

ANNEX I

Energy efficiency ranking, energy efficiency class and spin drying efficiency class

1. Energy efficiency ranking and energy efficiency class

The energy efficiency ranking and energy efficiency class of a washing machine shall be determined in accordance with its Energy Efficiency Index as in the following Table 1:

Table 1: Energy efficiency ranking and energy efficiency class of a washing machine

Energy Efficiency Ranking	Energy Efficiency Index	Energy Efficiency Class	
		Step 1	Step 2
10	$EEI < 40$	--	--
9	$40 \leq EEI < 45$	--	--
8	$45 \leq EEI < 52$	--	A
7	$52 \leq EEI < 59$	A	B
6	$59 \leq EEI < 68$	B	C
5	$68 \leq EEI < 77$	C	D
4	$77 \leq EEI < 87$	D	E
3	$87 \leq EEI < 100$	E	F
2	$100 \leq EEI < 113$	F	G
1	$EEI \geq 113$	G	--

The Energy Efficiency Index (EEI) of a washing machine shall be determined in accordance with Annex V

2. Spin drying efficiency class

The spin drying efficiency class of a washing machine shall be determined by the remaining moisture (in percentage) in accordance with the following Table 2:

Table 2: Spin drying performance class of a washing machine













Spin drying efficiency class	Remaining Moisture
7	$D < 45\%$
6	$45\% \leq D < 54\%$
5	$54\% \leq D < 63\%$
4	$63\% \leq D < 72\%$
3	$72\% \leq D < 81\%$
2	$81\% \leq D < 90\%$
1	$90\% \leq D$

The Remaining Moisture D of a washing machine shall be determined in accordance with Annex VI

ANNEX II
The Label

1. Label layout and timing

a) Step one: one year after the entry into force of this directive the label shall be in accordance with the following illustration:

 LABEL 20XX-20XX	<p align="center">Energy</p> <p>Manufacturer Model Capacity (cotton) kg</p>	<p align="center">Washing machine</p> <p align="center">Logo ABC 123 Y</p>
<p align="center">More efficient</p> <p>10 </p> <p>9 </p> <p>8 </p> <p>7  A</p> <p>6  B</p> <p>5  C</p> <p>4  D</p> <p>3  E</p> <p>2  F</p> <p>1  G</p> <p align="center">Less efficient</p>		
<p>Energy consumption kWh/year (based on a mix of 220 standard cotton cycles at full and partial load)</p> <p>Water consumption litre/year</p>		<p align="center">XYZ</p> <p align="center">XYZ</p>
<p>Spin drying efficiency 1: low 7: high</p>		<p align="center">1234567</p>
<p>Noise dB(A) re 1pW washing/spinning</p> <p align="center">Actual consumption depends on how the appliance is used Further information is contained in product brochures</p>		<p align="center">XY/YZ</p>

I
II
III
IV

V

VI


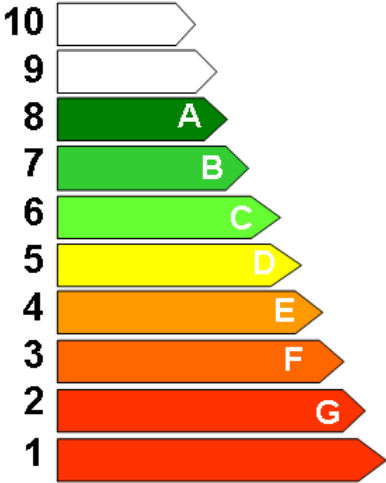

VII

VIII

IX

X

b) Step 2: [Six] years after the entry into force of this directive the label shall be in accordance with the following illustration:

 LABEL 20XX-20XX	<h2 style="text-align: center;">Energy</h2> <p>Manufacturer Model Capacity (cotton) kg</p>	<p style="text-align: center;">Washing machine</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Logo ABC 123 Y</p> </div>
<div style="text-align: center;"> <p>More efficient</p>  <p>Less efficient</p> </div>		<div style="border: 1px solid black; padding: 10px; text-align: center;"> <div style="background-color: black; color: white; width: 40px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">8</div>  </div>
<p>Energy consumption kWh/year (based on a mix of 220 standard cotton cycles at full and partial load)</p> <p>Water consumption litre/year</p>		<p style="text-align: center; font-size: 1.2em;">XYZ</p> <p style="text-align: center; font-size: 1.2em;">XYZ</p>
<p>Spin drying efficiency 1: low 7: high</p>		<p style="text-align: center; font-size: 1.2em;">1234567</p>
<p>Noise dB(A) re 1pW washing/spinning</p> <p>Actual consumption depends on how the appliance is used</p> <p>Further information is contained in product brochures</p>		<p style="text-align: center; font-size: 1.2em;">XY/YZ</p>

2. Notes on label

The following information shall be included in the label:

- I. Supplier's name or trade mark.
- II. Suppliers model identifier.

III. Period of the validity of the label, expressed as an interval in the range ‘year of beginning ‘ and ‘year of expiring’ for the two Steps described in Annex II, Part 1.

IV. Rated capacity of appliance, in kg, as the maximum mass in kg of dry cotton declared by the manufacturer that can be treated in the standard 60°C cotton programme at full load or in the standard 40°C cotton programme at full load, whichever is lower, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

V. The energy efficiency ranking of the washing machine, determined in accordance with Annex I, Table 1. The arrow shall be placed at the same level as the relevant energy efficiency ranking and shall show the same number.

VI. Without prejudice to any requirements under the Community Eco-label award scheme, where an appliance has been granted a ‘Community Eco-label award’ pursuant to Council Regulation (EEC) No 880/92⁵ a copy of the Eco-award mark (the flower) may be added here.

VII. Annual Energy Consumption (AE_C) of the washing machine, determined in accordance to Annex VI Part 1, in kWh per year, rounded to the integer.

VIII. Annual Water consumption (AW_C) of the washing machine, determined in accordance to Annex VI Part 2, in litre per year, rounded to the integer.

IX. Spin drying efficiency ranking, in accordance to Annex I, Table 2.

X. Noise, in washing and spinning phases, for the standard 60°C cotton programme at full load or the standard 40°C cotton programme, whichever is higher, expressed in dB(A) re 1 pW, rounded to the integer and determined in accordance with standards referred to in Chapter 1 (2) of this directive.

3. Printing

The following defines certain aspects of the label:

<to be added>

⁵ O.J.

ANNEX III The Fiche

The fiche shall contain the following information. The information may be given in the form of a table covering a number of washing machine models supplied by the same supplier, in which case it shall be given in the order specified, or given in the description of the washing machine model:

1. Supplier's name or trade mark, as in Annex II.
2. Supplier's model identifier, as in Annex II.
3. Capacity of appliance in kg of cotton, as in Annex II.
4. The energy efficiency ranking of the model, as defined in Annex I, expressed as 'Energy efficiency ranking [*number*] on a scale of 1 (less efficient) to 10 (more efficient) which corresponds to an energy efficiency class of [*letter*] in a scale from G to A in the period [*period of validity of the label*]' according to the two steps in Annex II Part 1. The energy efficiency class is according to Table 1.

Where this information is provided in a table this may be expressed by other means provided it is clear that the energy efficiency ranking is from 1 (less efficient) to 10 (more efficient) and the energy efficiency class in a scale from G to A according to Table 1 in the period [*period of validity of the label*].

5. Where the information is provided in a table, and where some of the appliances listed in the table have been granted a 'Community Eco-label award' under Regulation (EEC) No 880/92, this information may be included here. In this case the row heading shall state 'Community Eco-label award', and the entry shall consist of a copy of the Eco-award mark (the flower). This provision is without prejudice to any requirements under the Community Eco-label award scheme.
6. Annual Energy Consumption (AE_C) of the washing machine, as in Annex II; it shall be described as: 'Energy consumption XYZ kWh per year, based on 220 standard cycles for cotton programmes at 60°C and 40°C with full and partial load and the consumption of the low power modes. Actual energy consumption will depend on how the appliance is used.'
7. Annual Water consumption (AW_C) of the washing machine, as in Annex II; it shall be described as: 'Water consumption XYZ kWh per year, based on 220 standard cycles for cotton programmes at 60°C and 40°C with full and partial load. Actual water consumption will depend on how the appliance is used.'
8. Spin drying efficiency ranking, as in Annex I, expressed as 'Spin drying efficiency ranking [*number*] on a scale from 1 (low) to 7 (high)'. This may be expressed by other means provided it is clear that the scale is from 1 (low) to 7 (high).
9. Maximum spin speed attained for the standard 60 °C cotton programme at full load or the standard 40°C cotton programme at full load whichever is lower, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

10. Programme duration, determined in accordance to Annex VI, Part 1, in minutes and rounded to the nearest minute.

11. Noise, as in Annex II

12. If the model is produced in order to be built-in, this should be stated.

The information contained in the label may be given in the form of a copy of the label, either in colour or in black and white. In this case the further information given only in the fiche must still be included.

ANNEX IV
Other communications

Mail order catalogues and other printed communications referred to by Chapter 5 of this Directive shall contain the following information, given in the order specified:

1. Energy efficiency ranking and energy efficiency class as defined in Annex I
2. Rated capacity in kg of cotton (Annex III, point 3)
2. Annual Energy consumption (Annex III, point 6)
3. Annual Water consumption (Annex III, point 7)
4. Spin drying efficiency ranking (Annex III, point 8)
5. Maximum spin speed (Annex III, point 9)
6. Noise (Annex III, point 11)
7. If the model is produced in order to be built-in, this should be stated.

Where other information contained in the product information fiche is provided, it shall be in the form defined in Annex III and shall be included in the above list in the order specified for the fiche.

The size and font, in which all the information referred to above is printed, shall be legible.

ANNEX V
Verification procedure for market surveillance purposes

In addition to the procedure laid down in the standards referred to in Chapter 1 (2) of this Directive, when performing the market surveillance checks for the energy consumption of dishwashers the authorities of the Member States shall apply the following verification procedure, until a suitable harmonised standard is published for the purpose of this Annex.

Member State authorities shall test one single unit.

1 Annual Energy Consumption

The value measured shall not be greater than the rated value of AE_C by more than [10] %. If the result of the test carried out on the first washing machine is greater than the rated value plus 10 %, the test shall be carried out on a further three randomly selected washing machines. The arithmetical mean of the values of these three washing machines shall not be greater than the rated value plus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

2 Annual Water consumption

The value measured shall not be greater than the rated value of AW_C by more than [10]%. If the result of the test carried out on the first washing machine is greater than the rated value plus 10 %, the test shall be carried out on a further three randomly selected washing machines. The arithmetical mean of the values of these three washing machines shall not be greater than the rated value plus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

3 Spin drying efficiency (spin extraction)

The value measured shall not be lower than the rated value for the remaining moisture D by more than [10] %. If the result of the test carried out on the first washing machine is lower than the rated value by more than [10] %, the test shall be carried out on a further three randomly selected washing machines. The arithmetical mean of the values of these three washing machines shall not be lower than the rated value minus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

4 Spin speed

The value measured shall not be less than the rated value by more than [10] % or minus 100 rpm, whichever is the smaller value. If the result of the test carried out on the first

washing machine is less than the declared value by more than 10% or minus 100 rpm (whichever is the smaller value), the test shall be carried out on a further three washing machines, which shall be randomly selected from the market. The value of each of these three washing machines shall not be less than the rated values minus [10] % or minus 100 rpm, whichever is the smaller value.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

5 Energy consumption

The value measured shall not be greater than the rated value of E_r by more than [10] %. If the result of the test carried out on the first washing machine is greater than the rated value plus 10 %, the test shall be carried out on a further three randomly selected washing machines. The arithmetical mean of the values of these three washing machines shall not be greater than the rated value plus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

6 Water consumption

The value measured shall not be greater than the rated value of W_r by more than [10]%. If the result of the test carried out on the first washing machine is greater than the rated value plus 10 %, the test shall be carried out on a further three randomly selected washing machines. The arithmetical mean of the values of these three washing machines shall not be greater than the rated value plus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

7 Programme duration

The value measured shall not be longer than the rated value of T_r by more than [10] %. If the result of the test carried out on the first washing machine is longer than the declared values plus 10%, the test shall be carried out on a further three washing machines, which shall be randomly selected from the market. The value of each of these three washing machines shall not be longer than the declared value plus [10]%

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

8 Power consumption in off-mode and left-on mode

The verification of the power consumption P_o and P_l shall be done in accordance with Commission Regulation (EC) No .../.. of [...] implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment.

9 Duration of the left-on mode

The value measured shall not be longer than the rated value for T_l by more than [10] %. If the result of the test carried out on the first washing machine is longer than the declared values plus 10%, the test shall be carried out on a further three washing machines, which shall be randomly selected from the market. The value of each of these three washing machines shall not be longer than the declared value plus [10] %.

Otherwise, the model and all other equivalent washing machines shall be considered not to comply.

ANNEX VI

Method for calculating the Energy Efficiency Index, the annual water consumption and the remaining moisture

1. Calculation of the Energy Efficiency Index

For the calculation of the EEI of a washing machine, the energy consumption of a given washing machine is compared to the standard energy consumption of a washing machine with the same capacity.

a) The Energy Efficiency Index is calculated as:

$$EEI = \frac{AE_C}{SAE_C} \times 100 \text{ and is rounded to the first decimal place}$$

where:

- AE_C = annual energy consumption of a washing machine
- SAE_C = standard annual energy consumption of a washing machine.

b) The Annual Energy Consumption AE_C of a washing machine, in kWh/year and rounded to two decimal places, shall be calculated as:

$$AE_C = E_t \times 220 + \frac{\left[P_o \times \frac{525.600 - (T_t \times 220)}{2} + P_l \times \frac{525.600 - (T_t \times 220)}{2} \right]}{60 \times 1.000}$$

E_t is the energy consumption for the standard washing programmes, in kWh and recorded to three decimal places, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$E_t = (3 \times E_{t,60} + 2 \times E_{t,60\frac{1}{2}} + 2 \times E_{t,40\frac{1}{2}}) / 7$$

where

- $E_{t,60}$ is the energy consumption for the standard 60°C cotton programme at full load, in kWh, recorded to three decimal places;
- $E_{t,60\frac{1}{2}}$ is the consumption for the standard 60°C cotton programme at half load, in kWh, recorded to three decimal places;
- $E_{t,40\frac{1}{2}}$ is the energy consumption for the standard 40°C cotton programme at half load, in kWh, recorded to three decimal places;

P_l is the power in the ‘left-on mode’ for the standard washing programmes, in W and recorded to the second decimal place, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$P_l = (3 \times P_{l,60} + 2 \times P_{l,60\frac{1}{2}} + 2 \times P_{l,40\frac{1}{2}})/7$$

where

- $P_{l,60}$ is the power in ‘left-on mode’ for the standard 60°C cotton programme at full load, in W and recorded to the second decimal place;
- $P_{l,60\frac{1}{2}}$ is the power in ‘left-on mode’ for the for the standard 60°C cotton programme at half load, in W and recorded to the second decimal place;
- $P_{l,40\frac{1}{2}}$ is the power in ‘left-on mode’ for the standard 40°C cotton programme at half load, in W and recorded to the second decimal place.

P_o is the power in ‘off mode’ for the standard washing programmes, in W and recorded to the second decimal place, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$P_o = (3 \times P_{o,60} + 2 \times P_{o,60\frac{1}{2}} + 2 \times P_{o,40\frac{1}{2}})/7$$

where

- $P_{o,60}$ is the power in ‘off-mode’ for the standard 60°C cotton programme at full load, in W and recorded to the second decimal place;
- $P_{o,60\frac{1}{2}}$ is the power in ‘off-mode’ for the for the standard 60°C cotton programme at half load, in W and recorded to the second decimal place;
- $P_{o,40\frac{1}{2}}$ is the power in ‘off-mode’ for the standard 40°C cotton programme at half load, in W and recorded to the second decimal place.

T_t is the programme duration for the standard washing programmes, in minutes and recorded to the nearest minute, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$T_t = (3 \times T_{t,60} + 2 \times T_{t,60\frac{1}{2}} + 2 \times T_{t,c40\frac{1}{2}})/7$$

where

- $T_{t,60}$ is the programme duration for the standard 60°C cotton programme at full load, in minutes and recorded to the nearest minute;
- $T_{t,60\frac{1}{2}}$ is the programme duration for the for the standard 60°C cotton programme at half load, in minutes and recorded to the nearest minute;
- $T_{t,40\frac{1}{2}}$ is the programme duration for the standard 40°C cotton programme at half load, in minutes and recorded to the nearest minute.

When a power management is enforced, reverting automatically the product to the ‘off mode’ after the end of the programme, AE_C shall be calculated taking into consideration the effective duration of the “left-on mode”, according to the following formula:

$$AE_C = E_t \times 220 + \frac{\{(P_l \times T_l \times 220) + P_o \times [525.600 - (T_t \times 220) - (T_l \times 220)]\}}{60 \times 1.000}$$

where T_1 is the time in ‘left-on mode’ for the standard washing programmes, in minutes and recorded to the nearest minute, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$T_1 = (3 \times T_{1,60} + 2 \times T_{1,60/2} + 2 \times T_{1,40/2})/7$$

where

- $T_{1,60}$ is the time in ‘left-on mode’ for the standard 60°C cotton programme at full load, in minutes and recorded to the nearest minute;
- $T_{1,60/2}$ is the time in ‘left-on mode’ for the for the standard 60°C cotton programme at half load, in minutes and recorded to the nearest minute;
- $T_{1,40/2}$ is the time in ‘left-on mode’ for the standard 40°C cotton programme at half load, in minutes and recorded to the nearest minute.

The value 220 is the total number of standard washing cycles per year.

c) The Standard Annual Energy Consumption SAE_C of a washing machine shall be calculated, in kWh/year and rounded to two decimal places, as:

$$SAE_C = 47,0 \times c + 51,7$$

where c is the machine rated capacity for the standard 60°C cotton programme at full load or the standard 40°C cotton programme at full load, whichever is the lowest.

2. Calculation of the Annual Water consumption

The Annual Water Consumption AW_C of a washing machine in litres and rounded to the integer, shall be calculated as:

$$AW_C = W_t \times 220$$

where W_t is the water consumption for the standard washing programmes, in litres and rounded to one decimal place, determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$W_t = (3 \times W_{t,60} + 2 \times W_{t,60/2} + 2 \times W_{t,40/2})/7$$

where

- $W_{t,60}$ is the water consumption for the standard 60°C cotton programme at full load, in litres and recorded to one decimal place;
- $W_{t,60/2}$ is the water consumption for the standard 60°C cotton programme at half load, in litres and recorded to one decimal place;
- $W_{t,40/2}$ is the water consumption for the standard 40°C cotton programme at half load, in litres and recorded to one decimal place.

3. The remaining moisture

The remaining moisture content of a washing machine, in percentage and rounded to the nearest whole percent, shall be determined in accordance with standards referred to in Chapter 1 (2) of this directive as:

$$D = (3 \times D_{60} + 2 \times D_{60\frac{1}{2}} + 2 \times D_{40\frac{1}{2}}) / 7$$

where

- D_{60} is the residual moisture content for the standard 60°C cotton programme at full load, in percentage and recorded to the nearest whole percent;
- $D_{60\frac{1}{2}}$ is the residual moisture content for the standard 60°C cotton programme at half load, in percentage and recorded to the nearest whole percent;
- $D_{40\frac{1}{2}}$ is the residual moisture content for the standard 40°C cotton programme at half load, in percentage and recorded to the nearest whole percent;

4. Programmes to be used

The programmes used for the purpose of the declaration of the energy, water and power consumption, the spin drying efficiency and the programme duration shall be the same used for the purposes of the Commission Regulation (EC) No .../.. of [...] implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household washing machine.

5. Transitional period

In case no harmonised standard for the measurement of the standard 40°C cotton programme at partial load and the standard 60°C cotton programme at partial load is available one year after the entry into force of this directive, and unless this harmonised standard becomes available, the formulae for the calculation of E_t , P_t , P_o , T_t , T_b , W_t and D in Parts 1 to 3 of this Annex are substituted by the corresponding formulae in Annex VII.

ANNEX VII
Formulae for the transitional period

1. Calculation of the Energy Efficiency Index

$$E_t = [3 \times E_{t,60} + 2 \times (0,8 \times E_{t,60}) + 2 \times (0,64 \times E_{t,60})]/7$$

where $E_{t,60}$ is the energy consumption for the standard 60°C cotton programme at full load, in kWh and rounded to three decimal places, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

$$P_l = P_{t,60}$$

where $P_{l,60}$ is the power in ‘left-on mode’ for the standard 60°C cotton programme at full load, in W and recorded to two decimal places, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

$$P_o = P_{o,60}$$

where $P_{o,60}$ is the power in ‘off-mode’ for the standard 60°C cotton programme at full load, in W and recorded two decimal places, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

$$T_t = T_{t,60}$$

where $T_{t,60}$ is the programme duration for the standard 60°C cotton programme at full load, in minutes and recorded to the nearest minute, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

$$T_l = T_{l,60}$$

where $T_{l,60}$ is the measured time in “left-on mode” for the standard 60°C cotton programme at full load, in minutes and rounded to the nearest minute, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

2. The Annual Water consumption

$$W_t = W_{t,60}$$

where $W_{t,60}$ is the water consumption for the standard 60°C cotton programme at full load, determined in accordance with standards referred to in Chapter 1 (2) of this directive.

3. The remaining moisture

$$D = D_{60}$$

where D_{60} is the residual moisture content for the standard 60°C cotton programme at full load, in percentage and rounded to the nearest whole percent, determined in accordance with standards referred to in Chapter 1 (2) of this directive