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COMMISSION REGULATION (EC) No 244/2009

of 18 March 2009

**implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to
ecodesign requirements for non-directional household lamps**

(Text with EEA relevance)

(OJ L 76, 24.3.2009, p. 3)

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► <u>M1</u>	Commission Regulation (EC) No 859/2009 of 18 September 2009	L 247	3	19.9.2009
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**COMMISSION REGULATION (EC) No 244/2009****of 18 March 2009****implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps****(Text with EEA relevance)**

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council ⁽¹⁾ and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

- (1) Under Directive 2005/32/EC ecodesign requirements shall be set by the Commission for energy using products representing significant volumes of sales and trades, having significant environmental impact and presenting significant potential for improvement in terms of their environmental impact without entailing excessive costs.
- (2) Article 16(2) first indent of Directive 2005/32/EC provides that in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission shall as appropriate introduce an implementing measure on domestic lighting products.
- (3) The Commission has carried out a preparatory study which analysed the technical, environmental and economic aspects of lighting products typically used in households. The study has been developed together with stakeholders and interested parties from the Community and third countries, and the results have been made publicly available on the EUROPA website of the Commission.
- (4) Mandatory ecodesign requirements apply to products placed on the Community market wherever they are installed or used, therefore such requirements cannot be made dependent on the application in which the product is used (such as for domestic lighting).

⁽¹⁾ OJ L 191, 22.7.2005, p. 29.

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- (5) Products subject to this Regulation are designed essentially for the full or partial illumination of a household room, by replacing or complementing natural light with artificial light, in order to enhance visibility within that space. Special purpose lamps designed essentially for other types of applications (such as traffic signals, terrarium lighting, or household appliances) and clearly indicated as such on accompanying product information should not be subject to the ecodesign requirements set out in this Regulation.
- (6) New technologies emerging on the market such as light emitting diodes should be subject to this Regulation.
- (7) The environmental aspects of the products covered that are identified as significant for the purposes of this Regulation are energy in the use phase as well as mercury content and mercury emissions.
- (8) The annual electricity consumption related to products subject to this Regulation in the Community has been estimated to be 112 TWh in 2007, corresponding to 45 Mt CO₂ emissions. Without taking specific measures, the consumption is predicted to increase to 135 TWh in 2020. The preparatory studies showed that electricity consumption of products subject to this Regulation can be significantly reduced.
- (9) Mercury emitted in the different life cycle phases of the lamps, including from use-phase electricity generation and from the 80 % of compact fluorescent lamps containing mercury which are presumed not to be recycled at the end of life, has been estimated to be 2,9 tonnes in 2007 from the installed stock of lamps. Without taking specific measures, the mercury emissions of the installed lamp stock is predicted to increase to 3,1 tonnes in 2020 while it has been demonstrated that it can be significantly reduced.

Although the mercury content of compact fluorescent lamps is considered to be a significant environmental aspect, it is appropriate to regulate it under Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment ⁽¹⁾.

The setting of energy efficiency requirements for lamps subject to this Regulation will lead to a decrease of the overall mercury emissions.

- (10) Article 10(1)(d) of the Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on Waste Electrical and Electronic Equipment ⁽²⁾ should be fully implemented to ensure minimising the potential risks for the environment and for human health in case of accidental breakage of compact fluorescent lamps or at their end of life.

⁽¹⁾ OJ L 37, 13.2.2003, p. 19.

⁽²⁾ OJ L 37, 13.2.2003, p. 24.

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- (11) Improvements of electricity consumption of products subject to this Regulation should be achieved by applying existing non-proprietary cost effective technologies, which lead to a reduction of the combined expenses for purchasing and operating the equipment.
- (12) Ecodesign requirements for products subject to this Regulation should be set with a view to improving the environmental performance of the products affected, contributing to the functioning of the internal market and to the Community objective of reducing energy consumption by 20 % in 2020 compared with the assumed energy consumption in that year if no measures are implemented.
- (13) This Regulation should increase the market penetration of energy efficient products subject to this Regulation, leading to estimated energy savings of 39 TWh in 2020, compared with the assumed energy consumption in that year if no Ecodesign measure is implemented.
- (14) The ecodesign requirements should not affect functionality from the user's perspective and should not negatively affect health, safety or the environment. In particular, the benefits of reducing the electricity consumption during the use phase should over-compensate potential, if any, additional environmental impacts during the production phase of products subject to this Regulation.
- (15) A staged entry into force of the ecodesign requirements should provide a sufficient timeframe for manufacturers to re-design products subject to this Regulation as appropriate. The timing of the stages should be set in such a way that negative impacts related to functionalities of equipment on the market are avoided, and cost impacts for end-users and manufacturers, in particular small and medium enterprises, are taken into account, while ensuring timely achievement of the objectives of this Regulation.
- (16) Measurements of the relevant product parameters should be performed taking into account the generally recognised state of the art measurement methods; manufacturers may apply harmonised standards set up in accordance with Article 10 of Directive 2005/32/EC as soon as they are made available and published for that purpose in the *Official Journal of the European Union*.
- (17) In accordance with Article 8 of Directive 2005/32/EC, this Regulation should specify the applicable conformity assessment procedures.
- (18) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes V and VI to Directive 2005/32/EC in so far as this information relates to the requirements laid down in this Regulation.

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- (19) In addition to the legally binding requirements, the identification of indicative benchmarks for best available technologies for products subject to this Regulation should contribute to ensuring wide availability and to facilitating access to information. This can further facilitate the integration of best design technologies for improving the life cycle environmental performance of products subject to this Regulation.
- (20) A review of this measure should take particular note of the evolution of sales of special purpose lamp types so as to verify that they are not used for general lighting purposes, of the development of new technologies such as LEDs and of the feasibility of establishing energy efficiency requirements at the 'A' class level as defined in Commission Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75 with regard to energy labeling of household lamps ⁽¹⁾.
- (21) The requirements contained in this measure allow halogen lamps of socket G9 and R7s to remain on the market for a limited period of time, recognising the need to service the existing luminaire stock, to prevent undue costs on consumers and to give time to manufacturers to develop luminaires dedicated to more efficient lighting technologies.
- (22) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2005/32/EC,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

This Regulation establishes ecodesign requirements for the placing on the market of non-directional household lamps, including when they are marketed for non-household use or when they are integrated into other products. It also establishes product information requirements for special purpose lamps.

The requirements set out in this Regulation shall not apply to the following household and special purpose lamps:

- (a) lamps having the following chromaticity coordinates x and y :

$$— x < 0,200 \text{ or } x > 0,600$$

$$— y < - 2,3172 x^2 + 2,3653 x - 0,2800 \text{ or}$$

$$y > - 2,3172 x^2 + 2,3653 x - 0,1000;$$

- (b) directional lamps;

- (c) lamps having a luminous flux below 60 lumens or above 12 000 lumens;

⁽¹⁾ OJ L 71, 10.3.1998, p. 1.

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- (d) lamps having:
 - 6 % or more of total radiation of the range 250-780 nm in the range of 250-400 nm,
 - the peak of the radiation between 315-400 nm (UVA) or 280-315 nm (UVB);
- (e) fluorescent lamps without integrated ballast;
- (f) high-intensity discharge lamps;
- (g) incandescent lamps with E14/E27/B22/B15 caps, with a voltage equal to or below 60 volts and without integrated transformer in Stages 1-5 according to Article 3.

*Article 2***Definitions**

For the purposes of this Regulation, the definitions set out in Directive 2005/32/EC shall apply. The following definitions shall also apply:

1. ‘household room illumination’ means the full or partial illumination of a household room, by replacing or complementing natural light with artificial light, in order to enhance visibility within that space;
2. ‘lamp’ means a source made in order to produce an optical radiation, usually visible, including any additional components necessary for starting, power supply or stable operation of the lamp or for the distribution, filtering or transformation of the optical radiation, in case those components cannot be removed without permanently damaging the unit;
3. ‘household lamp’ means a lamp intended for household room illumination; it does not include special purpose lamps;

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4. ‘special purpose lamp’ means a lamp that uses the technologies covered by this Regulation but is intended for use in special applications because of its technical parameters as described in the technical documentation. Special applications are those that require technical parameters not necessary for the purposes of lighting average scenes or objects in average circumstances. These applications are of the following types:
 - (a) applications where the primary purpose of the light is not lighting, such as
 - (i) emission of light as an agent in chemical or biological processes (such as polymerisation, ultraviolet light used for curing/drying/hardening, photodynamic therapy, horticulture, pet care, anti-insect products);
 - (ii) image capture and image projection (such as camera flashlights, photocopiers, video projectors);
 - (iii) heating (infrared lamps);

▼ M2

- (iv) signalling (such as traffic control or airfield lamps);
- (b) lighting applications where
- (i) the spectral distribution of the light is intended to change the appearance of the scene or object lit, in addition to making it visible (such as food display lighting or coloured lamps as defined in point 1 of Annex I), with the exception of variations in correlated colour temperature; or
 - (ii) the spectral distribution of the light is adjusted to the specific needs of particular technical equipment, in addition to making the scene or object visible for humans (such as studio lighting, show effect lighting, theatre lighting); or
 - (iii) the scene or object lit requires special protection from the negative effects of the light source (such as lighting with dedicated filtering for photosensitive patients or photosensitive museum exhibits); or
 - (iv) lighting is required only for emergency situations (such as emergency lighting luminaires or control gears for emergency lighting); or
 - (v) the lighting products have to withstand extreme physical conditions (such as vibrations or temperatures below -20 °C or above 50 °C);

Incandescent lamps longer than 60 mm are not special purpose lamps, if they are resistant only to mechanical shock or vibrations and are not incandescent traffic signalling lamps; or they possess a rated power higher than 25 W and claim to have specific features that are also present in lamps having higher energy efficiency classes according to Regulation (EU) No 874/2012 (such as zero EMC emissions, CRI value higher or equal to 95, and UV emissions less or equal than 2 mW per 1 000 lm);

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5. 'directional lamp' means a lamp having at least 80 % light output within a solid angle of π sr (corresponding to a cone with angle of 120°);
6. 'non-directional lamp' means a lamp that is not a directional lamp;
7. 'filament lamp' means a lamp in which light is produced by means of a threadlike conductor which is heated to incandescence by the passage of an electric current. The lamp may or may not contain gases influencing the process of incandescence;

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8. 'incandescent lamp' means a filament lamp in which the filament operates in an evacuated bulb or is surrounded by inert gas;

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9. 'tungsten halogen lamp' means a filament lamp in which the filament is made of tungsten and is surrounded by gas containing halogens or halogen compounds in a bulb fabricated of quartz or hard glass, which may be assembled into a secondary envelope. It may be supplied with an integrated power supply;

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10. 'discharge lamp' means a lamp in which the light is produced, directly or indirectly, by an electric discharge through a gas, a metal vapour or a mixture of several gases and vapours;
11. 'fluorescent lamp' means a discharge lamp of the low pressure mercury type in which most of the light is emitted by one or several layers of phosphors excited by the ultraviolet radiation from the discharge. Fluorescent lamps are supplied either with or without integrated ballasts;
12. 'ballast' means a device which serves to limit the current of the lamp(s) to the required value in case it is connected between the supply and one or more discharge lamps. It may also include means for transforming the supply voltage, dimming the lamp, correcting the power factor and, either alone or in combination with a starting device, providing the necessary conditions for starting the lamp(s). It can be integrated or external to the lamp;
13. 'power supply' means a device which is designed to convert alternating current (AC) power input from the mains power source input into direct current (DC) or another AC output;
14. 'compact fluorescent lamp' means a unit which cannot be dismantled without being permanently damaged, provided with a lamp cap and incorporating a fluorescent lamp and any additional components necessary for starting and stable operation of the lamp;
15. 'fluorescent lamp without integrated ballast' means a single and double capped fluorescent lamp without integrated ballast;
16. 'high intensity discharge lamp' means an electric discharge lamp in which the light producing arc is stabilized by wall temperature and the arc has a bulb wall loading in excess of 3 watts per square centimetre;
17. 'light emitting diode' or 'LED' means a solid state device embodying a p-n junction, emitting optical radiation when excited by an electric current;

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18. 'LED lamp' means a lamp incorporating one or several LED;

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19. 'incandescent traffic signalling lamp' means an incandescent lamp with a rated voltage above 60 V, and a failure rate of less than 2 % during the first 1 000 hours of operation.

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For the purposes of Annexes II to IV, the definitions set out in Annex I shall also apply.

▼ M2*Article 3***Ecodesign requirements**

1. Non-directional household lamps shall meet the ecodesign requirements set out in Annex II.

Each ecodesign requirement shall apply in accordance with the following stages:

Stage 1: 1 September 2009,

Stage 2: 1 September 2010,

Stage 3: 1 September 2011,

Stage 4: 1 September 2012,

Stage 5: 1 September 2013,

Stage 6: 1 September 2018.

Unless a requirement is superseded or this is otherwise specified, it shall continue to apply together with the other requirements introduced at later stages.

2. Special purpose lamps shall comply with the following requirements:

(a) If the chromaticity coordinates of a lamp always fall within the following range:

$$x < 0,270 \text{ or } x > 0,530$$

$$y < -2,3172 x^2 + 2,3653 x - 0,2199 \text{ or } y > -2,3172 x^2 + 2,3653 x - 0,1595;$$

the chromaticity coordinates shall be stated in the technical documentation file drawn up for the purposes of conformity assessment in accordance with Article 8 of Directive 2009/125/EC, which shall indicate that these coordinates make them a special purpose lamp.

(b) For all special purpose lamps, the intended purpose shall be stated in all forms of product information, together with the warning that they are not intended for use in other applications.

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The technical documentation file drawn up for the purposes of conformity assessment in accordance with Article 8 of Directive 2009/125/EC shall list the technical parameters that make the lamp design specific for the stated intended purpose.

If needed, the parameters may be listed in such a way as to avoid disclosing commercially sensitive information linked to the manufacturer's intellectual property rights.

If the lamp is visibly displayed to the end-user prior to purchase, the following information shall be clearly and prominently indicated on the packaging:

- (i) the intended purpose;
- (ii) that it is not suitable for household room illumination; and
- (iii) the technical parameters that make the lamp design specific for the stated intended purpose.

The information in point (iii) can alternatively be provided inside the packaging.

▼ B*Article 4***Conformity assessment**

1. The conformity assessment procedure referred to in Article 8 of Directive 2005/32/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2005/32/EC, the technical documentation file shall contain a copy of the product information provided in accordance with Annex II, part 3, to this Regulation.

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

When performing the market surveillance checks referred to in Article 3(2) of Directive 2005/32/EC, the authorities of the Member States shall apply the verification procedure described in Annex III to this Regulation for the requirements set out in Annex II to this Regulation.

*Article 6***Indicative benchmarks**

The indicative benchmarks for best-performing products and technology available on the market at the time of adopting this Regulation are identified in Annex IV.

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Article 7

Revision

The Commission shall review this Regulation in light of technological progress no later than five years after the entry into force and present the result of this review to the Consultation Forum.

Article 8

Entry into force

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

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



ANNEX I

Technical parameters covered and definitions for the purposes of Annexes II to IV
1. TECHNICAL PARAMETERS FOR ECODSIGN REQUIREMENTS

For the purposes of compliance and verification of compliance with the requirements of this Regulation, the parameters below shall be established by reliable, accurate and reproducible measurement procedures, which take into account the generally recognised state of the art measurement methods.

- (a) ‘Lamp efficacy’ (η_{lamp}), which is the quotient of the luminous flux emitted (Φ) by the power consumed by the lamp (P_{lamp}): $\eta_{\text{lamp}} = \Phi / P_{\text{lamp}}$ (unit: lm/W). The power dissipated by non-integrated auxiliary equipment, such as ballasts, transformers or power supplies, is not included in the power consumed by the lamp;
- (b) ‘Lamp lumen maintenance factor’ (LLMF), which is the ratio of the luminous flux emitted by the lamp at a given time in its life to the initial (100 hour) luminous flux;
- (c) ‘Lamp survival factor’ (LSF), which is the defined fraction of the total number of lamps that continue to operate at a given time under defined conditions and switching frequency;
- (d) ‘Lamp lifetime’, which is the period of operation time after which the fraction of the total number of lamps which continue to operate corresponds to the lamp survival factor of the lamp, under defined conditions and switching frequency;
- (e) ‘Chromaticity’, which is the property of a colour stimulus defined by its chromaticity coordinates, or by its dominant or complementary wavelength and purity taken together;
- (f) ‘Luminous flux’ (Φ), which is a quantity derived from radiant flux (radiant power) by evaluating the radiation according to the spectral sensitivity of the human eye, measured after 100 hours of lamp running time;
- (g) ‘Correlated colour temperature’ (T_c [K]), which is temperature of a Planckian (black body) radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions;
- (h) ‘Colour rendering’ (R_a), which is the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under a reference illuminant;
- (i) ‘Specific effective radiant ultraviolet power’, which is the effective power of the ultraviolet radiation of a lamp weighted according to the spectral correction factors and related to its luminous flux (unit: mW/klm);
- (j) ‘Lamp start time’, the time needed, after the supply voltage is switched on, for the lamp to start fully and remain alight;
- (k) ‘Lamp warm-up time’, which is the time needed for the lamp after start-up to emit a defined proportion of its stabilized luminous flux;

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- (l) 'Power factor', which is the ratio of the absolute value of the active power to the apparent power under periodic conditions;
- (m) 'Luminance', which is the amount of light, per unit of apparent surface, that is emitted by or reflected by a particular area within a given solid angle (unit: cd/m²);
- (n) 'Lamp mercury content', which is the mercury contained in the lamp and is measured according to the Annex to Commission Decision 2002/747/EC ⁽¹⁾.

2. DEFINITIONS

- (a) a 'rated value' is the value of a quantity used for specification purposes, established for a specified set of operating conditions of a product. Unless stated otherwise, all requirements are set in rated values;
- (b) a 'nominal value' is the value of a quantity used to designate and identify a product;
- (c) 'Second lamp envelope' is a second outer lamp envelope which is not required for the production of light, such as an external sleeve for preventing mercury and glass release into the environment in case of lamp breakage, for protecting from ultraviolet radiation or for serving as a light diffuser;
- (d) 'Clear lamp' is a lamp (excluding compact fluorescent lamps) with a luminance above 25 000 cd/m² for lamps having a luminous flux below 2 000 lm and above 100 000 cd/m² for lamps having more luminous flux, equipped with only transparent envelopes in which the light producing filament, LED or discharge tube is clearly visible;
- (e) 'Non-clear lamp' is a lamp that does not comply with the specifications under point (d), including compact fluorescent lamps;
- (f) 'Switching cycle' is the sequence of switching on and switching off the lamp with defined intervals;
- (g) 'Premature failure' is when a lamp reaches its end of life after a period in operation which is less than the rated life time stated in the technical documentation;
- (h) 'Lamp cap' means that part of a lamp which provides connection to the electrical supply by means of a socket or lamp connector and, in most cases, also serves to retain the lamp in the socket;
- (i) 'Lamp holder' or 'socket' means a device which holds the lamp in position, usually by having the cap inserted in it, in which case it also provides the means of connecting the lamp to the electric supply.

⁽¹⁾ OJ L 242, 10.9.2002, p. 44.



ANNEX II

Ecodesign requirements for non-directional household lamps
1. LAMP EFFICACY REQUIREMENTS

Incandescent lamps with S14, S15 or S19 caps shall be exempted from the efficacy requirements of Stages 1 to 4 as defined in Article 3 of this Regulation, but not from Stages 5 and 6.

The maximum rated power (P_{\max}) for a given rated luminous flux (Φ) is provided in Table 1.

The exceptions to these requirements are listed in Table 2 and the correction factors applicable to the maximum rated power are in Table 3.

Table 1

Application date	Maximum rated power (P_{\max}) for a given rated luminous flux (Φ) (W)	
	Clear lamps	Non-clear lamps
Stages 1 to 5	$0,8 * (0,88\sqrt{\Phi+0,049\Phi})$	$0,24\sqrt{\Phi+0,0103\Phi}$
Stage 6	$0,6 * (0,88\sqrt{\Phi+0,049\Phi})$	$0,24\sqrt{\Phi+0,0103\Phi}$

Table 2
Exceptions

Scope of the exception	Maximum rated power (W)
Clear lamps $60 \text{ lm} \leq \Phi \leq 950 \text{ lm}$ in Stage 1	$P_{\max} = 1,1 * (0,88\sqrt{\Phi+0,049\Phi})$
Clear lamps $60 \text{ lm} \leq \Phi \leq 725 \text{ lm}$ in Stage 2	$P_{\max} = 1,1 * (0,88\sqrt{\Phi+0,049\Phi})$
Clear lamps $60 \text{ lm} \leq \Phi \leq 450 \text{ lm}$ in Stage 3	$P_{\max} = 1,1 * (0,88\sqrt{\Phi+0,049\Phi})$
Clear lamps with G9 or R7s cap in Stage 6	$P_{\max} = 0,8 * (0,88\sqrt{\Phi+0,049\Phi})$

The correction factors in Table 3 are cumulative where appropriate and also applicable to the products covered by the exceptions of Table 2.

Table 3
Correction factors

Scope of the correction	Maximum rated power (W)
filament lamp requiring external power supply	$P_{\max}/1,06$
discharge lamp with cap GX53	$P_{\max}/0,75$
non-clear lamp with colour rendering index ≥ 90 and $P \leq 0,5 * (0,88\sqrt{\Phi+0,049\Phi})$	$P_{\max}/0,85$
discharge lamp with colour rendering index ≥ 90 and $T_c \geq 5\,000 \text{ K}$	$P_{\max}/0,76$

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Scope of the correction	Maximum rated power (W)
non-clear lamp with second envelope and $P \leq 0,5$ * ($0,88\sqrt{\Phi}+0,049\Phi$)	$P_{\max}/0,95$
LED lamp requiring external power supply	$P_{\max}/1,1$

2. LAMP FUNCTIONALITY REQUIREMENTS

The lamp functionality requirements are set out in Table 4 for compact fluorescent lamps and in Table 5 for lamps excluding compact fluorescent lamps and LED lamps.

Where the rated lamp lifetime is higher than 2 000 h, the Stage 1 requirements for the parameters 'Rated lamp lifetime', 'Lamp Survival Factor' and 'Lumen maintenance' in Tables 4 and 5 are only applicable as from Stage 2.

For the purposes of testing the number of times the lamp can be switched on and off before failure, the switching cycle shall consist of periods comprising 1 minute on and 3 minutes off, while the other test conditions are defined according to Annex III. For the purposes of testing lamp lifetime, lamp survival factor, lumen maintenance and premature failure, the standard switching cycle according to Annex III shall be used.

Table 4*Functionality requirements for compact fluorescent lamps*

Functionality parameter	Stage 1	Stage 5
Lamp survival factor at 6 000 h	$\geq 0,50$	$\geq 0,70$
Lumen maintenance	At 2 000 h: $\geq 85\%$ ($\geq 80\%$ for lamps with second lamp envelope)	At 2 000 h: $\geq 88\%$ ($\geq 83\%$ for lamps with second lamp envelope) At 6 000 h: $\geq 70\%$
Number of switching cycles before failure	\geq half the lamp lifetime expressed in hours $\geq 10\,000$ if lamp starting time $> 0,3$ s	\geq lamp lifetime expressed in hours $\geq 30\,000$ if lamp starting time $> 0,3$ s
Starting time	$< 2,0$ s	$< 1,5$ s if $P < 10$ W $< 1,0$ s if $P \geq 10$ W
Lamp warm-up time to 60 % Φ	< 60 s or < 120 s for lamps containing mercury in amalgam form	< 40 s or < 100 s for lamps containing mercury in amalgam form
Premature failure rate	$\leq 2,0\%$ at 200 h	$\leq 2,0\%$ at 400 h
UVA + UVB radiation	$\leq 2,0$ mW/klm	$\leq 2,0$ mW/klm
UVC radiation	$\leq 0,01$ mW/klm	$\leq 0,01$ mW/klm
Lamp power factor	$\geq 0,50$ if $P < 25$ W $\geq 0,90$ if $P \geq 25$ W	$\geq 0,55$ if $P < 25$ W $\geq 0,90$ if $P \geq 25$ W
Colour rendering (Ra)	≥ 80	≥ 80

▼ M1**Table 5***Functionality requirements for lamps excluding compact fluorescent lamps and LED lamps*

Functionality parameter	Stage 1	Stage 5
Rated lamp lifetime	$\geq 1\,000$ h	$\geq 2\,000$ h
Lumen maintenance	$\geq 85\%$ at 75 % of rated average lifetime	$\geq 85\%$ at 75 % of rated average lifetime
Number of switching cycles	\geq four times the rated lamp life expressed in hours	\geq four times the rated lamp life expressed in hours
Starting time	$< 0,2$ s	$< 0,2$ s
Lamp warm-up time to 60 % Φ	$\leq 1,0$ s	$\leq 1,0$ s
Premature failure rate	$\leq 5,0\%$ at 100 h	$\leq 5,0\%$ at 200 h
Lamp power factor	$\geq 0,95$	$\geq 0,95$

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3. PRODUCT INFORMATION REQUIREMENTS ON LAMPS

For non-directional household lamps, the following information shall be provided as from Stage 2, except where otherwise stipulated.

3.1. **Information to be visibly displayed prior to purchase to end-users on the packaging and on free access websites**

The information does not need to be specified using the exact wording of the list below. It may be displayed using graphs, figures or symbols rather than text.

These information requirements do not apply to filament lamps not fulfilling the efficacy requirements of Stage 4.

- (a) When the nominal lamp power is displayed outside the energy label in accordance with Directive 98/11/EC, the nominal luminous flux of the lamp shall also be separately displayed in a font at least twice as large as the nominal lamp power display outside the label;
- (b) Nominal life time of the lamp in hours (not higher than the rated life time);
- (c) Number of switching cycles before premature lamp failure;
- (d) Colour temperature (also expressed as a value in Kelvins);
- (e) Warm-up time up to 60 % of the full light output (may be indicated as 'instant full light' if less than 1 second);
- (f) A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers;

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- (g) If designed for optimal use in non-standard conditions (such as ambient temperature $T_a \neq 25$ °C), information on those conditions;
- (h) Lamp dimensions in millimeters (length and diameter);
- (i) If equivalence with an incandescent lamp is claimed on the packaging, the claimed equivalent incandescent lamp power (rounded to 1 W) shall be that corresponding in Table 6 to the luminous flux of the lamp contained in the packaging.

The intermediate values of both the luminous flux and the claimed incandescent lamp power (rounded to 1W) shall be calculated by linear interpolation between the two adjacent values.

Table 6

Rated lamp luminous flux Φ [lm]			Claimed equivalent incandescent lamp power [W]
CFL	Halogen	LED and other lamps	
125	119	136	15
229	217	249	25
432	410	470	40
741	702	806	60
970	920	1 055	75
1 398	1 326	1 521	100
2 253	2 137	2 452	150
3 172	3 009	3 452	200

- (j) The term ‘energy saving lamp’ or any similar product related promotional statement about lamp efficacy may only be used if the lamp complies with the efficacy requirements applicable to non-clear lamps in Stage 1 according to Tables 1, 2 and 3.

If the lamp contains mercury

- (k) Lamp mercury content as X,X mg;
- (l) Indication which website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.

3.2. Information to be made publicly available on free-access websites

As a minimum, the following information shall be expressed at least as values.

- (a) The information specified in point 3.1;
- (b) Rated wattage (0,1 W precision);
- (c) Rated luminous flux;
- (d) Rated lamp life time;
- (e) Lamp power factor;
- (f) Lumen maintenance factor at the end of the nominal life;

▼B

- (g) Starting time (as X,X seconds);
- (h) Colour rendering.

If the lamp contains mercury

- (i) Instructions on how to clean up the lamp debris in case of accidental lamp breakage;
- (j) Recommendations on how to dispose of the lamp at its end of life.



ANNEX III

Verification procedure for market surveillance purposes

Member State authorities shall test a sample batch of minimum 20 lamps of the same model from the same manufacturer randomly selected.

The batch shall be considered to comply with the provisions set out in Annex II as applicable, of this Regulation if the average results of the batch do not vary from the limit, threshold or declared values by more than 10 %.

Otherwise, the model shall be considered not to comply.

For the purposes of checking conformity with the requirements, the authorities of the Member States shall use accurate and reliable state-of-the-art measurement methods which deliver reproducible results, including:

- where available, harmonised standards the reference numbers of which have been published for that purpose in the *Official Journal of the European Union* in accordance with Articles 9 and 10 of Directive 2005/32/EC,
- otherwise, the methods set out in the following documents:

Measured parameter	Organisation ⁽¹⁾	Reference	Title
Lamp mercury content	European Commission	Decision 2002/747/EC (Annex)	Commission Decision 2002/747/EC of 9 September 2002 establishing revised ecological criteria for the award of the Community eco-label to light bulbs and amending Decision 1999/568/EC
Luminous efficacy	Cenelec	EN 50285:1999	Energy efficiency of electric lamps for household use — Measurement methods
Lamp caps	Cenelec	EN 60061:1993 All amendments up to A40:2008	Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1: Lamp caps
Lamp lifetime	Cenelec	EN 60064:1995 Amendments A2:2003 A3:2006 A4:2007 A11:2007	Tungsten filament lamps for domestic and similar general lighting purposes - Performance requirements
	Cenelec	EN 60357:2003 Amendment A1:2008	Tungsten halogen lamps (non-vehicle) — Performance specifications
	Cenelec	EN 60969:1993 Amendments A1:1993 A2:2000	Self-ballasted lamps for general lighting services — Performance requirements
Lamp start time/warmup time	Cenelec	EN 60969:1993 Amendments A1:1993 A2:2000	Self-ballasted lamps for general lighting services — Performance requirements

▼B

Measured parameter	Organisation ⁽¹⁾	Reference	Title
Power factor	Cenelec	EN 61000-3-2:2006	Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
Specific effective radiant UV power	Cenelec	EN 62471:2008	Photobiological safety of lamps and lamp systems
Colour rendering	International Commission on Illumination	CIE 13.3:1995	Method of Measuring and Specifying Colour Rendering Properties of Light Sources
Chromaticity Correlated Colour Temperature (T _c [K])	International Commission on Illumination	CIE 15:2004	Colorimetry
Luminance	International Commission on Illumination	CIE 18.2:1983	The Basis of Physical Photometry
Luminous flux	International Commission on Illumination	CIE 84:1989	The Measurement of Luminous Flux
Lamp Lumen Maintenance Factor (LLMF)	International Commission on Illumination	CIE 97:2005	Maintenance of indoor electric lighting systems
Lamp Survival Factor (LSF)			

⁽¹⁾ Cenelec: rue de Stassart/De Stassartstraat 35, B-1050 Brussels, tel. (32-2) 519 68 71, fax (32-2) 519 69 19 (<http://www.cenelec.org>).
International Commission on Illumination: CIE Central Bureau Kegelgasse 27 A-1030 Vienna AUSTRIA tel: +43 1714 31 87 0 fax: +43 1714 31 87 18 (<http://www.cie.co.at/>).



ANNEX IV

Indicative benchmarks for non-directional household lamps

(for information)

At the time of adoption of this Regulation, the best available technology on the market for the products concerned was identified as follows:

1. LAMP EFFICACY

The highest identified efficacy was 69 lm/W.

2. LAMP FUNCTIONALITY

Table 7

Functionality parameter	Compact fluorescent lamps
Rated lamp lifetime	20 000 h
Lumen maintenance	90 % at the rated lamp lifetime
Number of switching cycles	1 000 000
Starting time	< 0,1 s
Lamp warm-up time to 80 % Φ	15 s, or 4 s for special mixed CFL/ halogen lamps
Lamp power factor	0,95

3. LAMP MERCURY CONTENT

The energy efficient compact fluorescent lamps with the lowest mercury content include not more than 1,23 mg mercury.