CABINET OF MINISTERS OF UKRAINE

RESOLUTION

of 27 March 2019 No. 264
Kyiv

On Approval of the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment

In accordance with Article 5 of the Law of Ukraine 'On Technical Regulations and Conformity Assessment', the Cabinet of Ministers of Ukraine hereby **resolves:**

1. The Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment shall be approved as attached.

2. The State Agency on Energy Efficiency and Energy Saving shall ensure the implementation of the Technical Regulation approved by this Resolution.

3. The attached amendment shall be introduced to the list of types of products subject to state market surveillance by state market surveillance authorities, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1069 of 28 December 2016 (Official Journal of Ukraine, 2017, No. 50, p. 1550).

4. This Resolution shall enter into force after six months following its publication.

Prime Minister of Ukraine **VOLODYMYR GROYSMAN**

Ind. 21

APPROVED
by the Resolution of the Cabinet of Ministers of Ukraine
No. 264 of 27 March 2019

TECHNICAL REGULATION on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment

General Provisions

1. This Technical Regulation establishes ecodesign requirements for placing on the market the following electrical lighting products (including where integrated in other products):

directional lamps;

light-emitting diode (LED) lamps;

related equipment designed for installation between the mains and the lamps, including lamp control gear, control devices and luminaires.

This Technical Regulation also establishes product information requirements for special purpose products.

The Technical Regulation is based on the Commission Regulation (EU) No. 1194/2012 of 12 December 2012 supplementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment.

2. This Technical Regulation shall not apply to LED modules if they are marketed as part of luminaires that are placed on the market in less than 200 units per year.

3. For the purposes of this Technical Regulation, the terms used herein shall have the following meanings:

‘accent lighting’ means a form of lighting where light is directed so as to highlight an object or a part of an area;

‘ballast’ means lamp control gear inserted between the supply and one or more discharge lamps which, by means of inductance, capacitance or a combination of inductance and capacitance, serves mainly to limit the current of the lamp(s) to the required value;

‘special purpose product’ means a product that uses the technologies covered by this Technical 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. Special applications are divided into the following types:

applications where the primary purpose of the light is not lighting, such as:

- emission of light as an agent in chemical or biological processes (such as polymerisation, ultraviolet light used for curing/drying/hardening, photodynamic therapy, horticulture, petcare, anti-insect products);

- image capture and image projection (in photocameras, photocopiers, video projectors);

- heating (infrared lamps);

- signalling (traffic control or airfield lamps);

lighting applications where:

- the spectral distribution of the light is intended to change the appearance of the scene or object lit, in addition to making it visible (goods display lighting or coloured lamps as defined in point 1 of Annex 1), with the exception of variations in correlated colour temperature;

- 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);

- illumination of scenes and objects lit requires special protection from the negative effects of the light source (lighting with dedicated filtering for photosensitive patients or photosensitive museum exhibits);

- lighting is required only for emergency situations;

- the lighting products have to withstand extreme physical conditions (vibrations or temperatures below - 20°Ñ or above + 50°C).

Incandescent lamps longer than 60 millimeters are not special purpose products, if they are resistant only to mechanical shock or vibrations and are not incandescent traffic signalling lamps; or if they possess a nominal power higher than 25 W and claim to have specific features that are also present in lamps having higher energy efficiency classes in accordance with the Technical Regulation on Energy Labelling of Electrical Lamps and Luminaires, approved by the Resolution of the Cabinet of Ministers of Ukraine No 340 of 27 May 2015 (Official Journal of Ukraine, 2015, No 44, p. 1387) (such as zero EMC emissions, CRI value higher or equal to 95, and UV emissions less or equal than 2 mW per 1000 lm);

‘electrical lighting product’ means a product designed for use with electricity and intended for use in lighting;

‘light source’ means an object designed to emit mainly visible optical radiation produced by a transformation of energy. The term ‘visible’ refers to a wavelength of 380-780 nm;

‘replaceable lamp control gear’ means non-integrated lamp control gear designed to be installed outside the enclosure of a lamp or luminaire, or to be removed from the enclosure without permanently damaging the lamp or the luminaire;

‘end-user’ means a person buying or expected to buy a product for purposes which are outside his trade, business, craft or profession;

‘lamp’ means a unit whose performance can be assessed independently and which consists of one or more light sources and may include additional components necessary for starting, power supply or stable operation of the unit or for distributing, filtering or transforming the optical radiation, in cases where those components cannot be removed without permanently damaging the unit;

‘halogen lamp’ means a filament lamp in which the filament is made of tungsten and is surrounded by gas containing halogens or halogen compounds. Such lamp may be supplied with an integrated power supply;

‘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 contain gases influencing the process of incandescence

‘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. Such lamp may be supplied with an integrated ballast;

‘compact fluorescent lamp’ means a fluorescent lamp that includes all the components necessary for starting and stable operation of the lamp;

‘fluorescent lamp without integrated ballast’ means a single- or double-capped lamp, not fitted with integrated ballast;

‘non-directional lamp’ means a lamp that is not a directional lamp;

‘incandescent lamp’ means a filament lamp in which the filament operates in an evacuated bulb or is surrounded by inert gas;

‘traffic signal incandescent lamp’ means an incandescent lamp of nominal voltage over 60 V having the premature failure rate of less than 2% at first 1000 operating hours;

‘discharge lamp’ means a lamp in which the light is produced directly by an electric discharge through a gas, a metal vapour or a mixture of gases and vapours;

‘high intensity discharge lamp’ means an electric discharge lamp in which the light- producing arc is stabilised by wall temperature and the arc has a bulb wall loading in excess of 3 W per sq. centimetre;

‘LED lamp’ means a lamp incorporating one or several LED modules that may be equipped with a cap;

‘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 120º);

‘lighting’ means the application of light to a scene, objects or their surroundings so that they may be seen by humans;

‘lamp holder’ means a device which holds the lamp in position, usually by having the cap inserted in it. In this case lamp holder also provides the means of connecting the lamp to the electric supply;

‘halogen lamp control gear’ means a device that transforms mains voltage to extra low voltage;

‘lamp control gear’ means a device located between the electrical supply and one or more lamps, which provides a functionality related to the operation of the lamp(s), such as transforming the supply voltage, limiting the current of the lamp(s) to the required value, providing starting voltage and preheating current, preventing cold starting, correcting the power factor or reducing radio interference. The device may be designed to connect to other lamp control gear to perform these functions.

The term does not include control devices and power supplies that convert input voltage into other supply voltage and are intended for use in appliances, combining lighting products and products whose primary purpose is not lighting;

‘control device’ means an electronic or mechanical device controlling or monitoring the luminous flux of the lamp by other means than power conversion, such as timer, switch, occupancy sensor, light sensor and daylight regulation device. Variable lighting intensity controls (dimmers) with supply phase cut function shall also be considered as control devices;

‘luminaire’ means an apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply (if the primary purpose is not lighting and the product is dependent on energy input in fulfilling its primary purpose during use, such product is not considered as a luminaire covered by this Technical Regulation);

‘light emitting diode (LED)’ means a light source which consists of a solid state device embodying a p-n junction, which emits optical radiation when excited by an electric current;

‘LED package’ means an assembly having one or more LED(s), which may include an optical element and thermal, mechanical and electrical interfaces;

‘LED module’ means a product having no caps and incorporating one or more LED packages on a printed circuit board. The product may include optical elements, thermal, mechanical and electrical interfaces and control gear;

‘lamp cap’ means that part of a lamp which provides connection to the electrical supply by means of a lamp holder or lamp connector and may also serve to retain the lamp in the lamp holder.

The definitions for the purpose of Annexes 3 to 5 are set out in Annex 2.

Other terms used herein shall have meanings set out in the Laws of Ukraine ‘On Technical Regulations and Conformity Assessment’, ‘On State Market Surveillance and Control of Non-Food

Products', 'On Standardization' and in the Technical Regulation establishing a framework for the setting of ecodesign requirements for energy-related products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804 (Official Journal of Ukraine, 2018, No. 80, p. 2678).

Ecodesign Requirements

4. The electrical lighting products listed in point 1 of this Technical Regulation (except special purpose products) shall meet the ecodesign requirements set out in Annex 3.

5. Each ecodesign requirement shall apply no later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force.

6. No later than two years after this Technical Regulation has come into force all special purpose products shall meet the product information requirements set out in Annex 1.

Conformity Assessment

7. Conformity of directional lamps, LED lamps and related equipment with the requirements of this Technical Regulation shall be assessed applying the internal design control procedure or the management system conformity assessment procedure set out, respectively, in Annexes 3 and 4 to the Technical Regulation establishing a framework for the setting of ecodesign requirements for energy-related products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804 (Official Journal of Ukraine, 2018, No. 80, p. 2678).

8. For the purposes of conformity assessment, the technical documentation file shall:

contain the information provided in accordance with part 3 of Annex 3, on the product;

provide any other information required by Annexes 1, 3 and 4 to be present in the technical documentation file;

specify at least one real combination of product settings and conditions in which the product complies with the requirements of this Technical Regulation.

State Market Surveillance

9. Verification of conformity of directional lamps, LED lamps and related equipment with the requirements of this Technical Regulation in the course of state market surveillance shall be made in accordance with the requirements set out in Annex 4.

Indicative Benchmarks

10. The indicative benchmarks for the best-performing products and technologies available on the market are set out in Annex 5.

Correlation Table

11. The correlation Table between the provisions of the Commission Regulation (EU) No. 1194/2012 of 12 December 2012 supplementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment, and this Technical Regulation is set out in Annex 6.

Annex 1
to the Technical Regulation

PRODUCT INFORMATION REQUIREMENTS
for special purpose products

1. If the chromaticity coordinates of a lamp always fall within the range of $x < 0,27$ or $x > 0,53$; $y < – 2,3172\ x^2 + 2,3653\ x - 0,2199$ 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 the Technical Regulation Establishing a Framework for the Setting of Ecodesign Requirements for Energy-Related Products, approved by the Resolution of the Cabinet of Ministers of Ukraine No 804 of 3 October 2018 (Official Journal of Ukraine, 2018, No 80, p. 2678), which shall indicate that these coordinates make them a special purpose product.

2. For all special purpose products, the intended purpose shall be stated in all forms of product information, together with the warning that these products are not intended for use in other applications.

The technical documentation file drawn up for the purposes of conformity assessment in accordance with the Technical Regulation Establishing a Framework for the Setting of Ecodesign Requirements for Energy-Related Products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804 (Official Journal of Ukraine, 2018, No. 80, p. 2678), shall list the technical parameters that make the product 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 product is visibly displayed to the end-user prior to purchase, the following information shall be clearly and prominently indicated on the packaging and in all other forms of product information, in particular:

the intended purpose;

that it is not suitable for household room illumination;

the technical parameters that make the product design specific for the intended purpose. Such information may be located inside the packaging.

Annex 2
to the Technical Regulation

DEFINITIONS
of the terms used in Annexes 3 to 5 to the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment

‘Anti-glare shield’ means a mechanical or optical reflective or non-reflective impervious baffle designed to block direct visible radiation emitted from the light source of a directional lamp, in order to avoid temporary partial blindness (disability glare) if viewed directly by an observer. It does not include surface coating of the light source in the directional lamp.

‘Useful luminous flux’ (Φ_{use}) means the part of the luminous flux of a lamp falling within the cone used for calculating the lamp’s energy efficiency in accordance with point 1 of Annex 3 to the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment (hereinafter referred to as Technical Regulation).

‘Lamp mercury content’ means the amount of mercury contained in the lamp.

‘Electrical lighting product’ means a product designed for use with electricity and intended for use in lighting.

‘Colour rendering’ (Ra) means the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under a reference illuminant.

‘Lamp survival factor’ (LSF) means the defined fraction of the total number of lamps that continue to operate at a given time under defined conditions and switching frequency.

‘Power factor’ is the ratio of the absolute value of the active power to the apparent power under alternate voltage conditions.

‘Lamp lumen maintenance factor’ (LLMF) means the ratio of the luminous flux emitted by the lamp at a given time in its life to the initial luminous flux.

‘Chromaticity’ means the property of a colour stimulus defined by its chromaticity coordinates, or by its dominant or complementary wavelength and purity taken together.

‘Correlated colour temperature’ (Tc [K]) means the 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.

‘Beam angle’ means the angle between two imaginary lines in a plane through the optical beam axis, such that these lines cross in the centre of the luminous element of the lamp and pass through points at which the luminous intensity is 50% of the axial beam intensity. In this case the axial beam intensity is the value of luminous intensity measured on the optical beam axis.

‘Nominal value’ means the value of a quantity used to designate and identify a product.

‘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.

‘Premature failure’ is a condition 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.

‘Standby power’ means the power consumed by the lamp control gear in standby mode.

‘No-load power’ means the power consumed by the lamp control gear in no-load mode.

‘Initial luminous flux’ means the luminous flux of a lamp after a certain operating period.

‘Standby mode’ means a mode of lamp control gear where the lamps are switched off with the help of a control signal under normal operating conditions. It applies to lamp control gear with switching function and permanently connected to the supply voltage when in normal use.

‘No-load mode’ means the condition of a lamp control gear where it is connected to the supply voltage and where its output is disconnected in normal operation from all the primary loads by the switch intended for this purpose (a faulty or missing lamp, or a disconnection of the load by a safety switch is not normal operation);

‘Luminous flux’ (Φ) means the quantity derived from radiant flux (radiant power) by evaluating the radiation in accordance with the spectral sensitivity of the human eye. Without further specification it refers to the initial luminous flux.

‘Control signal’ means an analogue or digital signal transmitted to the lamp control gear wirelessly or wired either via voltage modulation in separate control cables or via modulated signal in the supply voltage.

‘Luminous intensity’ means the quotient of the luminous flux leaving the source and propagated within the solid angle containing the given flux, by this solid angle, in candela (cd).

‘Compatibility’ means the condition when a product is intended to be installed in an installation, may be inserted into another product or connected to it through physical contact or wireless connection while:

it is possible to perform the installation, insertion or connection;

shortly after starting to use them together, end-users are not led to believe that any of the products has a defect;

the safety risk of using the products together is not higher than when the same products taken individually are used in combination with other products.

‘Colour consistency’ means the maximum deviation of chromaticity coordinates (x and y) of a single lamp from a chromaticity centre point (cx and cy), expressed as the size (in steps) of the MacAdam ellipse formed around the chromaticity centre point (cx and cy).

‘Lamp lifetime’ means the period of operating 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. For LED lamps, lamp lifetime means the operating time between the start of their use and the moment when only 50% of the total number of lamps survive or when the average lumen maintenance of the batch falls below 70%, whichever occurs first.

‘Switching cycle’ means the sequence of switching the lamp on and off at set intervals.

‘Lamp start time’ means the time needed, after the supply voltage is switched on, for the lamp to start fully and remain alight.

‘Lamp warm-up time’ means the time needed after start-up, for the lamp to emit a defined proportion of its stabilised luminous flux.

Annex 3
to the Technical Regulation

ECODESIGN REQUIREMENTS
for directional lamps, light emitting diode lamps and related equipment

Energy efficiency requirements for directional lamps

1. The energy efficiency index (EEI) of the lamp is calculated as follows and rounded to two decimal places:

$$EEI = \frac{P_{cor}}{P_{ref}},$$

where P_{cor} is the corrected actual power measured at nominal input voltage and corrected where appropriate in accordance with Table 1. The correction factors are cumulative where appropriate.

Table 1

Scope of the correction	Power, corrected by losses at the lamp control gear (P_{cor})
Lamps operating on replaceable halogen lamp control gear	P_{rated} õ 1,06
Lamps operating on replaceable LED lamp control gear	P_{rated} õ 1,1
Fluorescent lamps of 16 mm diameter (T5 lamps) and 4-pin single capped fluorescent lamps operating on replaceable fluorescent lamp control gear	P_{rated} õ 1,1
Other lamps operating on replaceable fluorescent lamp control gear	$P_{rated} \times \frac{0{,}24\sqrt{\Phi_{use}} + 0{,}0103\ \Phi_{use}}{0{,}15\sqrt{\Phi_{use}} + 0{,}0097\ \Phi_{use}}$
Lamps operating on external high-intensity discharge lamp control gear	P_{rated} õ 1,1
Compact fluorescent lamps with colour rendering index ≥ 90	P_{rated} õ 0,85
Lamps with anti-glare shield	P_{rated} õ 0,8

P_{ref} is the reference power obtained from the utilized (useful) luminous flux of the lamp (Φ_{use}) by the following formulae:

For models with Φ_{use} < 1 300 lumen: $P_{ref} = 0{,}88\sqrt{\Phi_{use}} + 0{,}049\ \Phi_{use}$;

For models with Φ_{use} < 1 300 lumen: P_{ref} = 0,07341 $\hat{O}_{use}$.

Φ_{use} is defined as follows:

directional lamps with a beam angle ≥ 90° other than filament lamps and carrying a warning on their packaging in accordance with the eleventh indent of point 17 of this Annex: nominal luminous flux in a 120° cone ($\Phi_{120°}$);

other directional lamps: nominal luminous flux in a 90° cone ($\hat{O}_{90°}$).

The maximum energy efficiency index (EEI) of directional lamps is indicated in Table 2.

Table 2

Mains-voltage filament lamps	Other filament lamps	High-intensity discharge lamps	Other lamps
0,95	0,95	0,36	0,2

Energy efficiency requirements for lamp control gear

2. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, the no-load power of a lamp control gear intended for use between the mains and the switch for turning the lamp load on/off shall not exceed 0,5 W. For lamp control gear with output power (P) over 250 W, the no-load power limits shall be multiplied by P/250 W.

3. The standby power of a lamp control gear shall not exceed 0,5 W.

4. The efficiency of a halogen lamp control gear shall be at least 0,91 at 100% load.

Functionality requirements for directional lamps other than LED lamps

5. The lamp functionality requirements are set out in Table 3 for directional compact fluorescent lamps and in Table 4 for directional lamps excluding compact fluorescent lamps, LED lamps and high-intensity discharge lamps.

Table 3

Functionality parameter	Detailed specific requirement except where indicated otherwise
Lamp survival factor at 6 000 h	≥ 0,7
Lumen maintenance	at 2 000 h: ≥ 83 % at 6 000 h: ≥ 70 %
Number of switching cycles before failure	≥ lamp lifetime expressed in hours ≥ 30 000 if lamp starting time > 0,3 s
Lamp start time	< 1,5 s if P < 10 W < 1 s if P ≥ 10 W
Lamp warm-up time to 60 % (Φ)	< 40 s

	or < 100 s for lamps containing mercury in amalgam form
Premature failure rate	≥ 5 % at 1 000 h
Lamp power factor for lamps with integrated control gear	≥ 0,55 if P < 25 W ≥ 0,9 if P ≥ 25 W
Colour rendering (Ra)	≥ 80 ≥ 65 if the lamp is intended for outdoor lighting or industrial applications according to the thirteenth indent of point 19 of this Annex

6. If the lamp cap is a standardised type also used with filament lamps, then the lamp shall comply with state-of-the-art requirements for compatibility with equipment designed for installation between the mains and filament lamps.

Table 4

Functionality parameter	Detailed specific requirement
Rated lamp lifetime at 50 % lamp survival	≥ 2 000 h ≥ 4 000 h for extra low voltage lamps
Lumen maintenance	≥ 80 % at 75 % of rated average lifetime
Number of switching cycles	≥ four times the rated lamp life expressed in hours
Starting time	< 0,2 s
Lamp warm-up time to 60 % (Φ)	≤ 1 s
Premature failure rate	≤ 5 % at 200 h
Lamp power factor for lamps with integrated control gear	power > 25 W: ≥ 0,9 power ≤ 25 W: ≥ 0,5

Functionality requirements for non-directional and directional LED lamps

7. The lamp functionality requirements for both non-directional and directional LED lamps are set out in Table 5.

Table 5

Functionality parameter	Detailed specific requirement except where indicated otherwise
Lamp survival factor at 6 000 h	≥ 0,9
Lumen maintenance at 6 000 h	≥ 0,8
Number of switching cycles before failure	≥ 15 000 if rated lamp life ≥ 30 000 h otherwise: no less than half the rated lamp life expressed in hours
Lamp start time	< 0,5 s
Lamp warm-up time to 95 % (Φ)	< 2 s
Premature failure rate	≤ 5 % at 1 000 h
Colour rendering (Ra)	≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications in accordance with the thirteenth indent of point 19 of this Annex
Colour consistency	variation of chromaticity coordinates within a six-step (or lesser) MacAdam ellipse
Lamp power factor (PF) for lamps with integrated control gear	P ≤ 2 W: no requirement 2 W < P ≤ 5 W: PF > 0,4 5 W < P ≤ 25 W: PF > 0,5 P > 25 W: PF > 0,9

8. If the lamp cap is a standardised type also used with filament lamps, then the lamp shall comply with state-of-the-art requirements for compatibility with equipment designed for installation between the mains and filament lamps.

Functionality requirement for equipment designed for installation between the mains and the lamps

9. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, equipment designed for installation between the mains and the lamps shall comply with state-of- the-art requirements for compatibility with lamps whose energy efficiency index (calculated for both directional and non-directional lamps in accordance with the method set out in point 1 of this Annex) is at most:

0,24 for non-directional lamps (assuming that Φ_{use} = total rated luminous flux);

0,4 for directional lamps.

10. When a dimming control device is switched on at its lowest control setting for which the operated lamps consume power, the operated lamps shall emit at least 1 % of their luminous flux at full load.

11. When a luminaire is placed on the market and intended to be marketed to the end-users, and lamps that the end- user can replace are included with the luminaire, these lamps shall be of one of the two highest energy classes, according to the Technical Regulation on Energy Labelling of Electrical Lamps and Luminaires, approved by the Resolution of the Cabinet of Ministers of Ukraine No 340 of 27 May 2015 (Official Journal of Ukraine, 2015, No 44, p. 1387), with which the luminaire is labelled to be compatible.

12. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, any luminaire for lamps intended to be replaced by end-users available on the market must be fully compatible with at least "A+" energy efficiency class according to provisions of the Technical Regulation on Energy Labelling of Electrical Lamps and Luminaires, approved by the Resolution of the Cabinet of Ministers of Ukraine No 340 of 27 May 2015 (Official Journal of Ukraine, 2015, No 44, p. 1387). The technical documentation file drawn up for the purposes of conformity assessment in accordance with the Technical Regulation Establishing a Framework for the Setting of Ecodesign Requirements for Energy-Related Products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804 (Official Journal of Ukraine, 2018, No. 80, p. 2678), shall specify at least one realistic combination of product settings and product test conditions.

Product information requirements for directional lamps

13. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, the following information shall be provided, except where otherwise stipulated.

14. For lamps other than high-intensity discharge lamps, the value and unit ('lm', 'K' and '°') of the nominal useful luminous flux, of the colour temperature and of the nominal beam angle shall be displayed in a legible font on the surface of the lamp if, after the inclusion of safety-related information such as power and voltage, there is sufficient space available for it on the lamp without unduly obstructing the light coming from the lamp.

15. If there is room for only one of the three values, the nominal useful luminous flux shall be provided. If there is room for two values, the nominal useful luminous flux and the colour temperature shall be provided.

16. Other information referred to in point 17 to be visibly displayed to end-users, prior to their purchase, on the packaging and on free access websites

17. The information shall be available on free access websites and in any other form the manufacturer deems appropriate. If the product is placed on the market in a packaging containing information to be visibly displayed to the end-users, prior to their purchase, the information shall also be clearly and prominently indicated on the packaging. The information may be displayed in the form of graphs, drawings or symbols and shall include:

nominal useful luminous flux displayed in a font at least twice as large as any display of the nominal lamp power;

nominal life time of the lamp in hours (not longer than the rated life time);

colour temperature, as a value in Kelvins and also expressed graphically or in words;

number of switching cycles before premature failure;

warm-up time up to 60% of the full light output (may be indicated as 'instant full light' if less than 1 second);

a warning if the lamp cannot be dimmed or can be dimmed only on specific devices (dimmers); in the latter case a list of appropriate dimmers shall be also provided on the manufacturer's website;

information on usage conditions if the product is designed for optimum use in non-standard conditions;

lamp dimensions in millimetres (length and largest diameter);

nominal beam angle in degrees;

a warning that the lamp is not suitable for accent lighting if the lamp's beam angle is ≥ 90º and its useful luminous flux as defined in point 1 of this Annex is to be measured in a 120° cone;

if the lamp cap is a standardised type also used with filament lamps, but the lamp's dimensions are different from the dimensions of the filament lamp(s) that the lamp is meant to replace, a drawing comparing the lamp's dimensions to the dimensions of the filament lamp(s) it replaces;

an indication that the lamp is of a type listed in Table 6 if the luminous flux of the lamp in a 90° cone ($\Phi_{90°}$) is not lower than the reference luminous flux indicated in Table 6 for the smallest wattage among the lamps of the type concerned. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor in Table 8;

an equivalence claim involving the power of a replaced lamp type if the replaced lamp type is listed in Table 6 and if the luminous flux of the lamp in a 90° cone ($\Phi_{90°}$) is not lower than the corresponding reference luminous flux in Table 6. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor in Table 8. The intermediate values of both the luminous flux and the claimed equivalent lamp power shall be calculated by linear interpolation between the two adjacent values and rounded to the nearest 1 W.

Table 6

Type	Power (W)	Reference value $\hat{O}_{90°}$ (lm)
Extra-low voltage reflector type		
MR11 GU4	20	160
	35	300
MR16 GU 5.3	20	180
	35	300
	50	540
AR111	35	250
	50	390
	75	640
	100	785
Mains-voltage blown glass reflector type		

R50/NR50	25	90
	40	170
R63/NR63	40	180
	60	300
R80/NR80	60	300
	75	350
	100	580
R95/NR95	75	350
	100	540
R125	100	580
	150	1 000
	Mains-voltage pressed glass reflector type	
PAR16	20	90
	25	125
	35	200
	50	300
PAR20	35	200
	50	300
	75	500
PAR25	50	350
	75	550
PAR30S	50	350
	75	550

	100	750
PAR36	50	350
	75	550
	100	720
PAR38	60	400
	75	555
	80	600
	100	760
	120	900

Table 7

Lamp type	Luminous flux multiplication factor
Halogen lamps	1
Compact fluorescent lamps	1,08
LED lamps	1 + 0,5 x (1 - LLMF), where LLMF is the lumen maintenance factor at the end of the nominal life

Table 8

LED lamp beam angle	Luminous flux multiplication factor
20º ≤ beam angle	1
15° ≤ beam angle < 20°	0,9
10° ≤ beam angle < 15°	0,85
beam angle < 10°	0,8

18. If the lamp contains mercury:

lamp mercury content (as X,X mg);

free-access website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.

19. Information shall be made publicly available on free-access websites and in any other form the manufacturer deems appropriate, in particular, the following information shall be expressed at least as values:

the information specified in points 17 to 18 of this Annex;

nominal power (0,1 W precision);

nominal useful luminous flux;

rated lamp life time;

lamp power factor;

lumen maintenance factor at the end of the rated life time (except for filament lamps);

starting time (as X,X seconds);

colour rendering;

colour consistency (only for LEDs);

nominal peak intensity in candela (cd);

nominal beam angle;

if intended for use in outdoor or industrial applications, an indication to this effect;

spectral power distribution in the range 180-800 nm;

if the lamp contains mercury: instructions on how to clean up the lamp debris in case of accidental lamp breakage; recommendations on how to dispose of the lamp at the end of its life for recycling in line with the law.

20. These requirements do not apply to:

filament lamps not fulfilling the efficacy requirements;

LED modules when marketed as part of a luminaire from which they are not intended to be removed by the end-user.

In all forms of product information, the term ‘energy-saving lamp’ or any similar product related promotional statement about lamp efficacy may be used only if the energy efficiency index of the lamp (calculated in accordance with the method set out in point 1 of this Annex) is 0,4 or below.

Additional product information requirements for LED lamps replacing fluorescent lamps without integrated ballast

21. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, manufacturers of LED lamps replacing fluorescent lamps without integrated ballast shall publish a warning on publicly available free-access websites and in any other form they deem appropriate that the overall energy efficiency and light distribution of any installation that uses such lamps are determined by the design of the installation.

Claims that an LED lamp replaces a fluorescent lamp without integrated ballast of a particular wattage may be made only if:

the luminous intensity in any direction around the tube axis does not deviate by more than 25% from the average luminous intensity around the tube;

the luminous flux of the LED lamp is not lower than the luminous flux of the fluorescent lamp of the claimed wattage for replacement. The luminous flux of the fluorescent lamp shall be obtained by multiplying the claimed wattage with the minimum luminous efficacy value;

the wattage of the LED lamp is not higher than the wattage of the fluorescent lamp it is claimed to replace.

The technical documentation file shall provide the data to support such claims.

Product information requirements for equipment other than luminaires, designed for installation between the mains and the lamps

22. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, if the equipment provides no compatibility with any of the energy-saving lamps according to points 9 to 12 of this Annex, a warning that the equipment is not compatible with energy-saving lamps shall be published on publicly available free-access websites and in any forms the manufacturer deems appropriate.

Product information requirements for lamp control gears

23. No later than in three years after the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment has come into force, such information shall be published on publicly available free access websites and in any forms the manufacturer deems appropriate, in particular:

indication that the product is intended to be used as a lamp control gear;

If applicable, the information that the product may be operated in no-load mode.

Annex 4
to the Technical Regulation

REQUIREMENTS
for verifying conformity of directional lamps, light emitting diode lamps and related equipment with the requirements of the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment during state market surveillance

General provisions

1. For the purposes of verifying conformity of directional lamps, light emitting diode lamps and related equipment with the requirements of the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment (hereinafter referred to as the 'Technical Regulation'), the state-of-the-art measurement methods laid down in the list of national standards, compliance with which provides a presumption of conformity of directional lamps, light emitting diode lamps and related equipment with the requirements of the Technical Regulation, shall be applied.

Verification procedure for lamps other than led lamps and for led lamps that are meant to be replaced in the luminaire by the end-user

2. Verification of conformity of the lamps with the requirements of the Technical Regulation shall be performed by the state market surveillance authorities by testing a sample batch of a minimum of 20 units of the same type from the same manufacturer, where possible obtained in equal proportion from four randomly selected points of sale, unless specified otherwise in the table.

3. The model shall be considered to comply with the requirements of the Technical Regulation if:

the lamps in the batch are accompanied by the required and correct product information;

the lamps in the batch are found to comply with the requirements of points 5 to 8 of Annex 3 to the Technical Regulation, applying state-of-the-art methods and criteria for assessing compliance;

testing of the parameters of the lamps in the batch listed in the table shows no non-compliance for any of the parameters.

Table

Parameter	Procedure
Lamp survival factor at 6 000 h (for LED lamps only)	the test shall end when the required number of hours is met, or when more than two lamps fail, whichever occurs first compliance: a maximum of two out of every 20 lamps in the test batch may fail before the required number of hours non-compliance: otherwise
Number of switching cycles before failure	the test shall end when the required number of switching cycles is reached, or when more than one out of every 20 lamps in the test batch have reached the end of their life, whichever occurs first compliance: at least 19 of every 20 lamps in the batch have no failure after the required number of switching cycles is reached non-compliance: otherwise

Starting time	compliance: the average starting time of the lamps in the test batch is not higher than the required starting time plus 10 %, and no lamp in the sample batch has a starting time longer than two times the required starting time non-compliance: otherwise
Lamp warm-up time to 60 % (Φ)	compliance: the average warm-up time of the lamps in the test batch is not higher than the required warm-up time plus 10 %, and no lamp in the sample batch has a warm-up time that exceeds the required warm-up time multiplied by 1,5 non-compliance: otherwise
Premature failure rate	the test shall end when the required number of hours is met, or when more than one lamp fails, whichever occurs first compliance: a maximum of one out of every 20 lamps in the test batch may fail before the required number of hours non-compliance: otherwise
Colour rendering (Ra)	ñompliance: the average Ra of the lamps in the test batch is not lower than three points of the required value, and no lamp in the test batch has a Ra value that is more than 3,9 points below the required value non-compliance: otherwise
Lumen maintenance at end of life and estimated lifetime value (for LED lamps only)	the term ‘end of life’ shall mean the point in time when only 50 % of the lamps are projected to survive or when the average lumen maintenance of the batch is projected to fall below 70 %, whichever is projected to occur first compliance: the lumen maintenance at end of life and the lifetime values at 6 000 h obtained by extrapolation from the lamp survival factor and from the average lumen maintenance of the lamps in the test batch are not lower than respectively the lumen maintenance and the estimated lifetime values declared in the product information minus 10 %. non-compliance: otherwise
Equivalence claims according to the thirteenth and the fourteenth indents of point 17 of Annex 3 for retrofit lamps	if only the compatibility claim is verified for compliance, it is sufficient to test 10 lamps, where possible obtained approximately in equal proportion from four randomly selected points of sale compliance: the average test results of the lamps in the test batch do not vary from the limit, threshold or declared values by more than 10 % non-compliance: otherwise
Beam angle	compliance: the average results of the lamps in the test batch do not vary from the declared beam angle by more than 25 % and the beam angle value of each individual lamp in the test batch does not deviate by more than 25 % of the nominal value

	non-compliance: otherwise
Peak intensity	compliance: the peak intensity of each individual lamp in the test batch is not less than 75 % of the rated intensity for the lamps of the same model type non-compliance: otherwise
Other parameters (including the energy efficiency index)	compliance: the average results of the lamp in the test batch do not vary from the limit, threshold or declared value by more than 10 % non-compliance: otherwise

Otherwise, the product model shall be considered not to comply with the requirements of the Technical Regulation.

Verification procedure for LED modules not intended to be replaced in the luminaire by the end-user

4. Verification of conformity of LED modules or luminaires with LED modules, not intended to be replaced in the luminaire by the end-user, with the requirements of the Technical Regulation shall be performed by the state market surveillance authorities by testing sample products of the same type from the same manufacturer, determined by random selection, where possible proportionally.

5. For points 8, 10 and 15 of this Annex, the number of sources shall be at least four where possible. For point 9 of this Annex, the number of sources shall be at least four where possible, unless the number of luminaires necessary to obtain by extraction 20 LED modules of the same model is less than four. In that case the number of sources shall be equal to the number of luminaires needed. For point 11 of this Annex, it should be mentioned that if the test on the first two luminaires fails, the next three luminaires to be tested shall come from three other sources where possible.

6. State market surveillance authorities shall apply such a procedure, until a conclusion regarding the compliance of model(s) of the LED module(s) is reached, or they conclude that testing cannot be performed.

7. ‘Luminaire’ refers to the luminaire containing the LED modules. Except in point 11 of this Annex, ‘test’ refers to the procedure described in points 2 and 3 of this Annex. If test results according to points 8 and 9 of this Annex are included in the technical documentation file, the state market surveillance authorities may choose the most appropriate one.

8. If the technical documentation of the luminaire provides for testing the whole luminaire as a light source, state market surveillance authorities shall test 20 luminaires as light sources. If the model of the luminaire is considered to comply with the requirements laid down in the Technical Regulation, the model(s) of the LED module(s) shall be considered to comply with the requirements laid down in the Technical Regulation. If the model of the luminaire is considered not to comply with the requirements of the Technical Regulation, the model(s) of the LED module(s) shall be considered not to comply with the requirements laid down in the Technical Regulation.

9. If the technical documentation of the luminaire allows for the removal of the LED module(s) for testing, state market surveillance authorities shall obtain enough luminaires to obtain 20 samples of each incorporated LED module model. The state market surveillance authorities shall follow the instructions of the technical documentation to dismantle the luminaires and test each LED module model separately. The conclusion regarding the compliance of the model(s) of the LED module(s) shall be made on the basis of the appropriate tests.

10. If according to the technical documentation of the luminaire, the luminaire manufacturer obtained the incorporated LED module(s) as individual product(s), marked with the mark of conformity with technical regulations, the state market surveillance authorities shall obtain 20 samples of each LED module model from the market for testing and test each LED module model separately. The conclusion regarding the compliance of the model(s) of the LED module(s) shall be made on the

basis of the appropriate tests. If the model(s) are not available any more on the market, market surveillance cannot be performed.

11. If the luminaire manufacturer did not obtain the incorporated LED module(s) as individual product(s), marked with the mark of conformity with technical regulations, the state market surveillance authorities shall request the luminaire manufacturer to deliver a copy of the original test data of the LED module(s) showing that the LED module(s) comply with the requirements applicable to:

all LED modules in Table 5 of Annex 3 to the Technical Regulation;

if they are directional LED modules, mentioned in Table 1 and 2 of Annex 3 to the Technical Regulation;

if they are non-directional LED modules.

12. If according to the test data, none of the LED module model(s) in the luminaire complies with the requirements, the model(s) of the LED module(s) shall be considered not to comply with the requirements of the Technical Regulation.

13. State market surveillance authorities shall dismantle a single luminaire to check that the LED module(s) in the luminaire are the same type as described in the test data. If any of them is different or cannot be identified, the model(s) of the LED module(s) shall be considered not to comply with the requirements of the Technical Regulation.

14. The switching cycles, premature failure, starting time and warm-up time requirements of Table 5 of Annex 3 shall be tested on another luminaire operated at that rating. During operation of the luminaire at such conditions, the temperature of the LED module(s) shall be also tested against the defined limits. If the results of the tests (other than on premature failure) vary from the limit values by more than 10 %, or the luminaire failed prematurely, three more luminaires shall be tested. If the averages of the results of the subsequent three tests (other than those relating to premature failure and to operating temperature) do not vary from the limit values by more than 10 %, none of the luminaires failed prematurely, and the operating temperature (in °C) is within 10 % of the defined limits in all three of them, the model(s) of the LED module(s) shall be considered to comply with the requirements of the Technical Regulation. Otherwise, they shall be considered not to comply with the requirements of the Technical Regulation.

15. If testing according to points 8 to 11 of this Annex is not possible because no independently testable LED modules can be distinguished in the luminaire, the state market surveillance authorities shall test the switching cycles, premature failure, starting time and warm-up time requirements of Table 5 on a single luminaire. If the results of the tests vary from the limit values by more than 10 %, or the luminaire failed prematurely, three more luminaires shall be tested. If the averages of the results of the subsequent three tests (other than those relating to premature failure) do not vary from the limit values by more than 10 %, and none of the luminaires failed prematurely, the model(s) of the LED module(s) incorporated into the luminaire shall be considered to comply with the requirements of the Technical Regulation. Otherwise, they shall be considered not to comply with the requirements of the Technical Regulation.

Verification procedure for equipment designed for installation between the mains and the lamps

16. State market surveillance authorities shall test one single unit.

17. The equipment shall be considered to comply with the requirements of the Technical Regulation if it is found to comply with the conformity provisions of points 9 to 12 of Annex 3 to the Technical Regulations, applying state-of-the-art methods and criteria for assessing conformity. If non-conformity is concluded, the model shall still be considered to comply if it fulfils the product information requirements in point 22 of Annex 3 to to the Technical Regulation or in points 5, 9 to 11 of the Technical Regulation on Energy Labelling of Electrical Lamps and Luminaires, approved by the Resolution of the Cabinet of Ministers of Ukraine No 340 of 27 May 2015 (Official Journal of Ukraine, 2015, No 44, p. 1387).

18. In addition to the compatibility tests, lamp control gear shall also be tested for the efficiency requirements in points 2 to 4 of Annex 3 to the Technical Regulation. The test shall be carried out on a single piece of lamp control gear of a kind, not on several pieces of lamp control gear of different kinds, even if the model is designed to rely on other kinds of lamp control gear to operate the lamp(s) in a given installation. The model shall be considered to comply with the requirements if the results do not vary from the limit values by more than 2,5 %. If the results vary from the limit values by more than 2,5 %, three more units shall be tested. The model shall be considered to comply with the requirements if the average of the results of the subsequent three tests does not vary from the limit values by more than 2,5 %.

19. In addition to the conformity requirements, luminaires intended to be marketed to end-users shall also be checked for the presence of lamps in their packaging. The model shall be considered to comply if no lamps are present or if the lamps that are present are of the energy classes required in points 9 to 12 of Annex 3 to the Technical Regulation.

20. In addition to the compatibility tests, dimming control devices shall be tested with filament lamps when the control device is in the minimum dimming position. The model shall be considered to comply if, when installed according to the manufacturer’s instructions, the lamps provide at least 1 % of their luminous flux at full load.

21. If the model does not fulfil the applicable compliance criteria referred to above, it shall be considered not to comply with the requirements of the Technical Regulation.

Annex 5
to the Technical Regulation

INDICATIVE BENCHMARKS
for directional lamps, light emitting diode lamps and related equipment

Indicative benchmarks for the best available technology on the market as regards the environmental aspects that were considered significant and are quantifiable are as follows:

directional lamp efficiency (the most efficient lamp had an energy efficiency index of 0,16);

lamp mercury content (there are lamps that contain no mercury and are among the most energy-efficient);

halogen lamp control gear efficiency (the most efficient halogen lamp control gear has an efficiency of 0,93).

Features required in certain applications (such as high colour rendering) could prevent products offering those features from achieving these benchmarks.

Annex 6
to the Technical Regulation

CORRELATION TABLE
between the provisions of the Commission Regulation (EU) No. 1194/2012 of 12 December 2012, as amended by the Commission Regulation (EU) No. 2015/1428 of 25 August 2015, implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment, and the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment

Provisions of the Commission Regulation (EU)	Provisions of the Technical Regulation
Article 1	points 1, 2
First indent of Article 2	first indent of point 3
Point 1 of Article 2	thirty-fourth indent of point 3
Point 2 of Article 2	second indent of point 3
Point 3 of Article 2	seventeenth indent of point 3
Point 4 of Article 2	fourth indent of point 3
Point 5 of Article 2	eighteenth indent of point 3
Point 6 of Article 2	twenty-first indent of point 3
Point 7 of Article 2	forty-fifth indent of point 3
Point 8 of Article 2	thirty-sixth indent of point 3
Point 9 of Article 2	thirty-third indent of point 3
Point 10 of Article 2	twenty-seventh indent of point 3
Point 11 of Article 2	twenty-third indent of point 3
Point 12 of Article 2	twenty-eighth indent of point 3
Point 13 of Article 2	twenty-second indent of point 3
Point 14 of Article 2	thirtieth indent of point 3

Point 15 of Article 2	twenty-fourth indent of point 3
Point 16 of Article 2	twenty-sixth indent of point 3
Point 17 of Article 2	thirty-first indent of point 3
Point 18 of Article 2	forty-second indent of point 3
Point 19 of Article 2	forty-third indent of point 3
Point 20 of Article 2	forty-fourth indent of point 3
Point 21 of Article 2	thirty-second indent of point 3
Point 22 of Article 2	thirty eighth indent of point 3
Point 23 of Article 2	fortieth indent of point 3
Point 24 of Article 2	nineteenth indent of point 3
Point 25 of Article 2	third indent of point 3
Point 26 of Article 2	twenty-seventh indent of point 3
Point 27 of Article 2	twenty-fifth indent of point 3
Point 28 of Article 2	forty-first indent of point 3
Point 29 of Article 2	twentieth indent of point 3
Point 30 of Article 2	thirty fifth indent of point 3
Point 31 of Article 2	twenty-ninth indent of point 3
Article 3	points 4 to 6
Article 4	points 7 to 8
Article 5	point 9
Article 6	point 10
Article 7	

Article 8	
Annex I	Annex 1
Annex II	Annex 2
Annex III	Annex 3
Annex IV	Annex 4
Annex V	Annex 5

APPROVED
by the Resolution of the Cabinet of Ministers of Ukraine
No. 264 of 27 March 2019

AMENDMENT
to be introduced to the list of types of products subject to state market surveillance by state market surveillance authorities

Point 33 shall be replaced by the following:

‘33. Electrical lamps and luminaires	Resolution by the Cabinet of Ministers of Ukraine No. 340 of 27 May 2015 “On Approval of the Technical Regulation on Energy Labelling of Electrical Lamps and Luminaires” Resolution by the Cabinet of Ministers of Ukraine No. 264 of 27 March 2019 “On Approval of the Technical Regulation on Ecodesign Requirements for Directional Lamps, Light Emitting Diode Lamps and Related Equipment”	State Service of Ukraine on Food Safety and Consumer Protection’.