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**Changes to legislation:** There are outstanding changes not yet made to Commission Regulation (EC) No 245/2009. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) View outstanding changes

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## ANNEX VII

### Indicative benchmarks for products meant to be installed as public street lighting (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 BENCHMARKS

##### 1.1. Lamp performance

Lamps have an efficacy according to Annex V.

These lamps have the lamp lumen maintenance factors (LLMF) and lamp survival factors (LSF) in Table 24:

TABLE 24

Indicative LLMF and LSF for public street lighting lamps (benchmark level)

<b>Burning hours</b>	<b>2 000</b>	<b>4 000</b>	<b>8 000</b>	<b>16 000</b>
<b>LLMF</b>	0,98	0,97	0,95	0,92
<b>LSF</b>	0,99	0,98	0,95	0,92

In addition, these lamps are dimmable to at least 50 % of their light output when the rated lamp lumen output is above 9 000 lumen.

##### 1.2. Product information for lamps

The following information is provided on free-access websites and in other forms the manufacturers deem appropriate for lamps:

The information required by Annex III.1.3, as applicable.

#### 2. LIGHT SOURCE CONTROL GEAR BENCHMARKS

##### 2.1. Light source control gear performance

Fluorescent lamp ballasts have an energy efficiency index of at least A1 BAT according to Annex III.2.2 and are dimmable.

High intensity discharge lamp ballasts have an efficiency of above 87 % ( $\leq 100$  W lamp power) and else above 89 % measured according to Annex II and are dimmable if the sum of lamp powers operated on the same ballast is above or equal to 55 W.

Any other types of light source control gear have an efficiency of above 87 % ( $\leq 100$  W input power) and else above 89 % when measured according to the applicable measurement standards and are dimmable for lamps equal or above total input power 55 W.

##### 2.2. Product information for light source control gear

The following information is provided on free-access websites and in other forms the manufacturers deem appropriate for light source control gear:

Information on the efficiency of the ballast or the applicable type of light source control gear.

#### 3. LUMINAIRE BENCHMARKS

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### 3.1. Luminaire performance

Luminaires have an optical system that has an ingress protection rating as follows:

- IP65 for road classes ME1 to ME6 and MEW1 to MEW6
- IP5x for road classes CE0 to CE5, S1 to S6, ES, EV and A

The proportion of the light emitted by an optimally installed luminaire going above the horizon should be limited to:

TABLE 25

Indicative maximum Upward Light Output Ratio (ULOR) values per road class for street lighting luminaires (at benchmark level)

Road classes ME1 to ME6 and MEW1 to MEW6, all lumen outputs	3 %
Road classes CE0 to CE5, S1 to S6, ES, EV and A:	
— 12 000 lm ≤ light source	5 %
— 8 500 lm ≤ light source < 12 000 lm	10 %
— 3 300 lm ≤ light source < 8 500 lm	15 %
— light source < 3 300 lm	20 %

In areas where light pollution is of concern, the maximum proportion of the light going above the horizon is not more than 1 % for all road classes and lumen outputs.

Luminaires are designed so that they avoid emitting obtrusive light to the maximum extent. However, any improvement of the luminaire aiming at reducing the emission of obtrusive light is not to the detriment of the overall energy efficiency of the installation for which it is designed.

If they are luminaires for fluorescent or high-intensity discharge lamps, they are compatible with at least one lamp type complying with the benchmarks of Annex V.

Luminaires are compatible with installations equipped with appropriate dimming and control systems that take account of daylight availability, traffic and weather conditions, and also compensate for the variation over time in surface reflection and for the initial dimensioning of the installation due to the lamp lumen maintenance factor.

### 3.2. Product information on luminaires

The following information is provided on free-access websites and in other forms the manufacturers deem appropriate for the relevant models:

- (a) the information required by Annex III.3.2 and Annex V, as applicable;
- (b) Utilisation Factor values for standard road conditions in tabular form for the defined road class. The table contains the most energy efficient UF values for different road widths, different pole heights, maximum pole distances, luminaire overhang and inclination, as appropriate for the given road class and luminaire design;

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- (c) installation instructions for optimising the Utilisation Factor;
- (d) additional installation recommendations to minimise obtrusive light (if not conflicting with UF optimisation and safety);
- (e) for all luminaires, excluding luminaires with bare lamps and no optics, applicable luminaire maintenance factor (LMF) value data is provided according using a similar table:

TABLE 26

Indicative luminaire maintenance factor values (benchmark level)

<b>LMF values</b>							
<b>Pollution category</b>	<b>Exposure time in years</b>						
	<b>1,0</b>	<b>1,5</b>	<b>2,0</b>	<b>2,5</b>	<b>3,0</b>	<b>3,5</b>	<b>4,0</b>
High							
Medium							
Low							

For luminaires for directional light sources such as reflector lamps or LEDs, only the applicable information is provided, e.g. LLMF × LMF instead of simply the LMF.

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**Changes and effects yet to be applied to :**

- Regulation revoked by [S.I. 2021/1095 reg. 19\(b\)](#)

**Changes and effects yet to be applied to the whole legislation item and associated provisions**

- Annex 1 para. 2(b) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(b\)](#)
- Annex 1 para. 2(c) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(c\)](#)
- Annex 1 para. 2(e)(f) substituted for Annex 1 para. 2(e) by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(d\)](#)
- Annex 1 para. 1 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(a\)](#)
- Annex 1 para. 2(b) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(b\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(c) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(c\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(e) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(f) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 3 para. 1.3 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(a\)](#)
- Annex 3 para. 2.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(b\)](#)
- Annex 3 para. 3.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(c\)](#)