

Rules for Protecting the Night Environment

– a necessary and sufficient set

(This version of the Rules contains short comments meant for getting a better overview. The rules, based on the world's best legislation valid in five Italian provinces, esp. in Lombardy, are meant as a template for legal protection at a province, state or national level, including it into the standard protection of the atmosphere; with numbering starting at 35a instead of 1, they are to become a bill for Czech Republic)

PROTECTION OF THE NIGHT ATMOSPHERE

§ 1

Artificial sources of light *(as sources of air pollution)*

Artificial sources of light and luminaires containing them, with exception of light equipment of vehicles, are considered to be small stationary sources of pollution of the air.

§ 2

Measures to lower light pollution

(1) *(enabling suitable units for expressing this kind of pollution)*

Because of the nature of light as a polluting substance, instead or in addition to the quantities used for most pollutants, analogous photometric quantities are used: pollution, emission limits and ceilings are expressed in units of luminous flux, luminous intensity or luminance; level of the pollution, imissions and imission limits in units of luminance, illuminance of luminous flux density.

(2) *(setting the demands for all future changes of lighting)*

All luminaires and systems of them, which are from [date of validity] being installed in the territory of [country], have to obey the rules according to articles 3 to 6 of this §.

(3) Luminaires and outdoor lighting systems shall:

- a) *(not shine up! – defined by the standard technical limit of 0 cd/klm)*
not shine horizontally and upwards, with exception of the case given in article 5; as a complying luminaire even each such is considered, whose specific luminous intensity horizontally and upwards is less then half a candela per thousand lumens of the luminous flux produced inside it;
- b) *(limit on amount of light)*
be used in such a way that the illuminance of the target surfaces does not exceed the value demanded by safety standards, if they exist, or in the absence of such standards, the illuminance of the target surface does not exceed 10 lux or at least the luminance of the target surface does not exceed 1 cd/m²; only if it is a surface which conveys text information or image instructions, its luminous intensity is allowed to reach two

hundred candelas, or three hundred candelas for a surface larger than 5 m², or five hundred candelas for a surface larger than 30 m².

- c) *(dimming or switching-off late at night)*
be equipped with devices capable of reducing the amount of emitted light by at least thirty per cent compared to the full output; such reduction of the amount of light is applied when the conditions of the use of the illuminated surface are such that safety is not endangered.

(4) *(general exceptions)*

The properties given in article 3 are not obligatory for luminaires which fulfil at least one of the following three conditions:

- a) *(faint sources)*
contain just light sources whose luminous flux does not exceed 1500 lumens, if the cumulative luminous upward flux from the luminaires placed in any region with a radius of two metres does not exceed 2250 lumens;
- b) *(temporary sources)*
are in use at most for three weeks in a single year and are not used in the period from 23:00 to 5:00;
- c) *(traffic lights)*
are used as light signals for the purposes of ensuring transport safety, defence and security of [country].

(5) *(architectural lighting additional rules and an exception not easy to misuse)*

Illumination of buildings and pieces of art is to be, for the whole period from 23:00 to 5:00, switched off or reduced by at least one half. Even luminaires shining upwards can be exceptionally used for illumination of these structures, provided that the local government decides that such a way of lighting a specified surface is needed; in case of such illumination there is an obligation that the object is illuminated by a beam, whose margin does not exceed the outline of the illuminated object or exceeds it just very slightly and with imissions behind the outline of the object being not over five lux.

(6) *(labelling the luminaires)*

Manufacturers and importers are obliged since [date of validity] to certify, together with another technical parameters of the marketed luminaires, also the compliance of the individual products to this law and to the technical implementation standards, so that they attach both a Declaration of Conformity issued by the approved national and international institutes engaged with product safety and quality, and instructions for proper installation and use.

(7) *(banning skybeamers)*

Using upward, only into the air aimed movable or fixed beams of any type from a light source producing more than 1500 lumens or from a laser with an output over 5 mW is considered as an especially serious light pollution. Such beams are prohibited, if they are not approved by aviation safety institutions.

§ 3

Protection of particularly sensitive sites

(1) *(nature reserves and observatories)*

Light pollution is lowered by this law in the small-sized particularly protected areas (namely nature reserves and nature monuments) and further around buildings, which are approved as astronomical observatories.

(2) *(reducing direct light to them soon)*

The luminaires which are located within the areas given in article 1 or in their surroundings or in surroundings of buildings given in article 1, if they are nearer than 5 km from such sites, have to obey a limit, that illuminance from any of such luminaires does not exceed one millilux when viewed from such a location. If they don't obey it, they have to be shielded or replaced before [2 years since the date of validity] in such a way, that they will obey this limit.

(3) *(switching-off unessential lights late at night)*

Luminaires placed nearer than 1 km to a given site shall be extinguished during the period from 23:00 to 5:00, if their use is not necessary because of safety reasons.

(4) *(empowering self-governing bodies to demand sooner and larger improvements)*

The local government may issue a generally obligatory edict, in which it sets further measures to lower light pollution, in addition to those which are given in § 2. The reason for accepting such measures may be protection of pedestrians and drivers against glare, protection of citizens in their homes against light trespass, nature protection. The local government may declare some localities in the edict, where the direct glare and the night hours for using the luminaires are restricted.

Recommended additional rules

On the topmost level, the rules should be simple and easy to check and enforce. Some additional ones can be implemented, alternatively at a lower, perhaps the very local level:

limiting the proportion of light flux missing the terrain to be illuminated (for the beginning, say to 30 % for broad roads and 50 % for narrow paths),

prohibiting light sources which emit light with a non-negligible blue component after curfew,

controlling the yearly change of installed light flux on the whole territory or its specified parts – allowing a positive number like 2 % for the beginning but demanding a negative number some years later,

demanding that billboards and advertising signs are switched off at the closing time of the shop, or at least at 23 p.m. if the shop closes earlier,

demanding barriers for light escaping from windows of houses to be build.

(English draft by J. Hollan, Jan 2006, based on the bill for the Parliament of the Czech Republic available with all the background reasoning at <http://www.astro.cz/darksky>.)