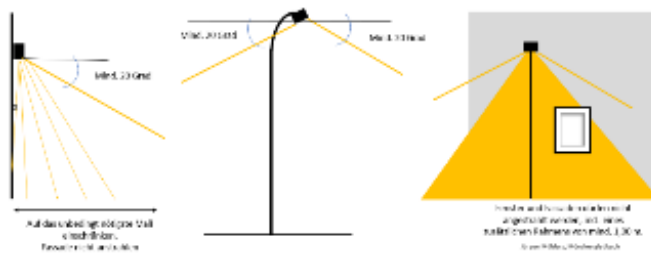


Example

for an ordinance on the

Limitation of light pollution

These examples set additional requirements outside the technical and legal regulations for traffic, people and nature



Lighting concept for people and nature

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Example of a regulation on the limitation of light pollution

This ordinance is an example and can be adopted in the development plans or for the municipal area. Adjustments, changes can be made. It is also necessary to describe how binding this "regulation" should be. It can also be introduced as a guideline, guideline or indications.

The REGULATION on the limitation of light pollution in industrial zones

Article 1 Purpose

1. This Regulation will:
measures to reduce light emissions into the environment;
the limit values of light emissions for the area of cultural monuments and the lighting directed at them,
the limit values for light emissions for protected spaces in buildings caused by luminaires used to illuminate uncovered surfaces;
the prohibition of the use of light in the form of light beams radiating into the sky or onto the surfaces that reflect the light into the sky (e.g. ground spots, laser lights, uplights and sky projectors)

for the protection of nature and the population from the harmful effects of light pollution and glare, for the protection of sky brightening and for the reduction of electricity consumption by light sources causing light pollution.
2. If an ordinance on the limitation of light pollution has been introduced in the municipality or city, this introduced ordinance applies.

Article 2 Application

1. The limit values and measures provided for in this Regulation shall apply to continuous or occasional light emissions into the environment caused by the operation of the light sources.
2. The provisions of this Regulation shall not apply to light emissions into the environment caused by:
 1. the lighting of the inner rooms of the building or the covered rooms of the engineering structures,
 2. surveillance lighting, if its operation is regulated by regulations or standards for technical safety systems,
 3. activities to protect against natural and other disasters, if they are carried out as a result of the performance of tasks within the framework of protection, rescue and assistance activities, as well as during medical, police and other assistance,
 4. signalling in air transport in accordance with the rules on signalling in air transport,
 5. road signalling in accordance with road traffic signalling regulations,
 6. signalling in rail transport and train travel in accordance with the rules on signalling in rail transport and train journeys,
 7. luminaires with an electrical connected load of less than 25 W, if they are not used for the lighting referred to in Article 3(5) as the light source;
 8. events at public and private (e.g. folk festivals, concerts, etc.) and
 9. as decorative lighting of buildings, engineering structures and public areas in the period between 1 December and 15 Januarycan be caused.

Article 3 Lighting luminaires

- (1) For lighting, luminaires are used, the proportion of the luminous flux shining upwards (according to Fig.2, 20 degrees below the horizon) is equal to 0%.
- (2) Luminaires with a maximum of 3,200 K and reduced blue content are used for lighting.
- (3) A flat lighting system or an illuminated surface must not exceed 10 lm/sqm (according to Fulda).
 $1 \text{ candela/square meter } [\text{cd}/\text{m}^2] = 1 \text{ lumen/square meter/steradian}$
- (4) The lighting must be positioned in such a way that the façade surfaces and windows of residential buildings are not illuminated.
- (5) In order to prevent glare, the illuminated floor area must not exceed 10 cd/sqm (according to Fulda).
- (6) Lighting with rapidly changing and/or moving light, flashing light and light that gives the impression of running writing, moving figures or signs are only permitted with the consent of the supervisor pursuant to § 10 and must comply with Article 3(1), Article 7(4).
- (7) Notwithstanding the provisions of the preceding paragraphs, luminaires may be used to illuminate the public areas of the streets in the vicinity of a cultural monument, the proportion of the luminous flux radiating upwards does not exceed 5% if:
 - a) the electrical power of each luminaire is less than 20 W,

- b) the average illuminance of public areas illuminated by such luminaires does not exceed 2 lx, and
 - c) the illuminated public area of the streets is intended for pedestrians, cyclists or slow traffic with vehicles with a speed of not more than 20km/h.
- (8) Notwithstanding the provisions of paragraph 1 of this Article, there shall be no restrictions on the proportion of upward luminous flux for luminaires that are part of the cultural monument if the electrical power of individual luminaires is less than 20 W, with a greatly reduced proportion of blue.
- (9) A maximum of 5% of the luminous flux may pass by the cultural monument.

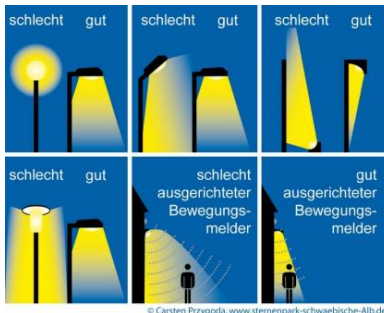


Fig. 1

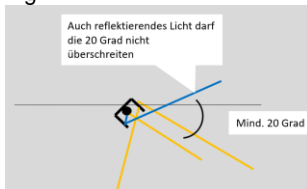


Fig. 3

Examples of bad and good lighting

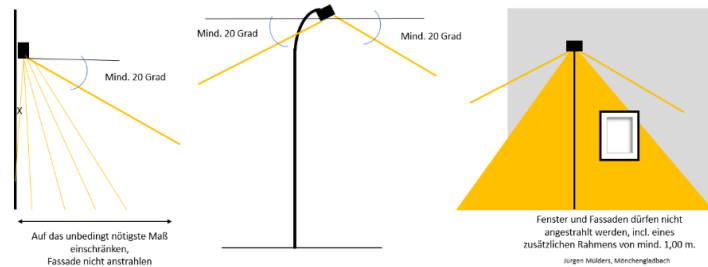


Fig. 2

Article 4 Protection of endangered species

- (1) If there is a habitat of endangered animal species in illuminated buildings or objects, the surfaces of this object on which flight openings of these animal species are located may not be illuminated.
- (2) The lighting must be positioned in such a way that plants, shrubs and trees have a minimum distance of 2.00 m, with the exception of luminaires whose electrical connected load is less than 25 W.

Article 5 Lighting of advertising objects

- (1) Advertising objects may be illuminated with luminaires positioned inside it and illuminating the image or inscription from the inside to the outside and complying with Article 3.
- (2) The light of the shop windows should be directed towards objects and goods to be exhibited and radiation into the city/street space should be avoided (according to Article 3 (1)). The limit value is max. 40 lux – on the surface up to a maximum of 1.0 m away from the shop window and over the entire length of the shop window area, measured on the floor. (from Guideline of the City of Fulda)



Article 6 Lighting of construction sites

- (1) Uncovered construction site areas and other uncovered areas on which maintenance or other renovation work on engineering structures or buildings are carried out may be illuminated by luminaires which do not comply with the requirements laid down in Article 3 of this Regulation. Care must be taken to ensure that the radiation is as low as possible above, in accordance with Article 3 point 1 (Fig. 2).
- (2) The uncovered construction site areas and other uncovered areas referred to in the previous paragraph shall be illuminated only by luminaires complying with the requirements laid down in Article 3 of this Regulation for 30 minutes after completion of the work.

Article 7 Operating hours of lighting

- (1) The operator / owner of the lighting should ensure that the lighting is switched off during the daytime from morning to evening, except in very bad weather conditions (e.g. dense fog, heavy rain or snowfall) analogous to the switching times of the street lighting.
- (2) The lighting of sports fields should be switched off no later than 10.00 p.m. or no later than one hour after the end of the sports or other event.
- (3) The luminaires for advertising objects lighting must remain switched off during the night's rest between 10.30 p.m. and 5.30 a.m.
- (4) The shop window lighting is to be limited to operating times as required, analogous to the switching times of street lighting. During the night's rest from 10:30 p.m. to 5:30 a.m., the lighting of the shop windows must be switched off. In the city's shopping malls, window lighting can be reduced by 80% during the night's rest and additionally in consultation with Article 10.

Article 8 Lighting plan

The operator / owner of the lighting, whose total electrical power of the luminaires in accordance with Article 3 exceeds 5 kW, shall draw up a lighting plan or 1 kW, in the case of lighting of cultural monuments, facades or advertising objects.

Article 9 Light pollution caused by interior lighting (glass facades, glass roofs, skylights)

- (1) The light from buildings or large parts of the façade (glass facades) should be avoided from radiating into the outdoor space (according to Article 3 (1)). The limit value is max. 40 lux at a distance of 2.00 m perpendicular to the glass surface.
- (2) According to Article 3, glass roofs of commercial buildings must not radiate light upwards, analogous to the switching times of street lighting.
- (3) Paragraph (2) applies accordingly to roof windows in the commercial sector, in the private sector the windows may not emit any light upwards in accordance with Article (3). The light in these rooms must not exceed 3,000 K with a reduced proportion of blue and the reflections must be reduced to a maximum in line with the switching times of the street lighting.

Article 10 Supervision

The responsible person and contact person is the _____.

Article 11 Adaptation of existing luminaires

By _____ at the latest, existing lighting must be installed / adapted in such a way that the proportion of the luminous flux radiating upwards equals 0%, according to article (3).

Article 12 Entry into force

This Regulation shall apply to _____

Place, date

Signature