

ICS 43.150



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 31887.1-2025

**Cycles - Lighting and retro-reflective devices - Part 1: Lighting
and light signalling devices**

自行车 照明和回复反射装置 第1部分：照明和光信号装置

(English Translation)

Issued on: October 31, 2025

Implemented on: May 1, 2026

Issued by: State Administration for Market Regulation

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1 Scope

This document specifies the functions, safety requirements, and optical performance of bicycle lighting and light signaling devices, and describes the corresponding test methods.

This document applies to lighting and light signaling devices for bicycles used on public roads, particularly two-wheeled bicycles conforming to GB 3565.2 and GB 14746.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 31887.4, Cycles - Lighting and retro-reflective devices - Part 4. Lighting systems powered by the cycle's movement (GB/T 31887.4-2025, ISO 6742-4:2023,

IDT)

GB/T 31887.5, Cycles - Lighting and retro-reflective devices - Part 5. Lighting systems not powered by the cycle's movement (GB/T 31887.5-2025, ISO 6742-

5:2023, IDT)

GB/T 39388, Characterization of the performance of illuminance meters and luminance

meters (GB/T 39388-2020, CIE S 023/E.2013, IDT)

Note: CIE S 023/E.2013 has been superseded by ISO/CIE 19476.2014.

CIE 1931, Color Space

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

front position lamp

3.16

continuous light

Light with a frequency greater than 50 Hz.

3.17

light emitting surface

All or part of the outer surface of a transparent lens, encompassing lighting and light signaling device, that meets specific photometric and chromatic acuity requirements.

Note: An example is given in UN/ECE Regulation No. 48.

[Source: ISO 12509.2023, 3.1.12, modified]

4.1 General

If the manufacturer has not specified a reference axis, the direction of the reference axis shall be determined by the direction in which the lamp emits the maximum light intensity.

Within the range of light distribution, if the graph is displayed in coordinate form, the light intensity in each direction of the region formed by the coordinate lines must at least satisfy the requirement that the lowest, minimum percentage value be displayed on the relevant directional coordinate line.

Illuminance meters and luminance meters shall be calibrated in accordance with GB/T 39388 or equivalent standards.

4.2.1 Photometric requirements

The requirements for front position lamp in Table 1 shall correspond to the letter symbols in Figure 1.

All values expressed in lux (lx) shall be measured on a vertical screen installed 10 m in front of the light. If the measurement distance is not 10 m, the measurement result shall

conform to the law of inversely proportional to the square of the distance, and be converted to a value at 10 m. The angular aperture of the receiver as viewed from the reference center of the lamp shall be between 0.17° and 1° .

From the perspective of the observation direction, if the requirement that the deviation in one direction is no more than 0.25° is met, then the light intensity requirement for a specific observation direction shall be accepted.

Except for those equipped with incandescent lamps, the light intensity and chromaticity of any other lamps measured 1 minute and 30 minutes after being turned on shall meet the requirements. The light intensity distribution 1 minute after the lamps are turned on can be obtained by calculating the ratio of the light intensity distribution 30 minutes after the lamps are turned on at each test point, measured at $H = V = 0^\circ$ after 1 minute and 30 minutes respectively.

In the case of short pulse, the effective light intensity of the flash shall be measured according to Appendix B.

If the lamps are provided by the same light source for both flash and continuous modes, their performance shall be measured in continuous mode. The light intensity of the flash mode shall be measured only on the reference axis. The flash intensity in other directions shall be calculated proportionally to the continuous intensity in those directions compared to the reference axis.

The chromaticity of LED lights shall be measured according to the test method described in CIE 1931.

6.2 Power supply and light source for testing optical performance

Vehicle lamps shall be equipped with a light source specified by the manufacturer and operate at its reference luminous flux under the voltage specified by the manufacturer in accordance with GB/T 31887.4 and GB/T 31887.5.

For lighting systems powered by the cycle's movement as specified in GB/T 31887.4, the following DC or AC power supplies may be used.

a) LED lighting device, test voltage 6 V; current not exceeding.

- 1) 2.4 W head lamps (3 W/2.4 W system). 440 mA;
- 2) 1.2 W head lamps (1.5 W system). 220 mA;
- 3) 0.6 W rear lamps (3 W system). 110 mA;
- 4) 0.3 W rear lamps (1.5 W system). 55 mA.

b) Alternatively, the lighting fixture can be measured using a test current.

- 1) 2.4 W head lamps (3 W/2.4 W system). 400mA;

2) 1.2 W head lamps (1.5 W system). 200mA;

3) 0.6 W rear lamps (3 W system). 100mA;

4) 0.3 W rear lamps (1.5 W system). 50mA.

The voltage on the equipment shall not exceed 6.7 V DC or 6.7 V (RMS) AC.

For AC power supplies, the internal resistance of the power supply shall not be less than 100 ohm (see Appendix C).

c) Lighting devices using incandescent light bulbs.

1) Adjustable incandescent lamp. luminous flux depends on the lamp's parameters;

2) Non-adjustable incandescent lamp. 6 V.

6.3 Test bench installation

Vehicle lamps shall be installed on the test bench according to the recommendations of the bicycle manufacturer or lighting manufacturer.

During the measurement process, the lighting shall meet the manufacturer's requirements.

If the instruction manual does not explicitly state this, there are two options.

-- H-H refers to lines where the illuminance at or above this line is no greater than 2 lx;

-- H-H is a line 3.5° above Emax.

Note: Measure the illuminance value on a vertical wall 10 m in front of the head lamp.

6.4.1 Measurement preparation and measurement conditions

Measurements shall be performed on the test track or test bench under the following conditions.

a) The slope of the test track or test bench shall not exceed 0.5%;

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