
**Cycles — Lighting and retro-reflective
devices —**

**Part 1:
Lighting and light signalling devices**

*Cycles — Éclairage et dispositifs rétroréfléchissants —
Partie 1: Équipements de signalisation et d'éclairage*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 6742-1:2023

[https://standards.iteh.ai/catalog/standards/sist/0d9675da-dc30-4e51-a124-
eb01d3388fd0/iso-6742-1-2023](https://standards.iteh.ai/catalog/standards/sist/0d9675da-dc30-4e51-a124-eb01d3388fd0/iso-6742-1-2023)



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 6742-1:2023

<https://standards.iteh.ai/catalog/standards/sist/0d9675da-dc30-4e51-a124-eb01d3388fd0/iso-6742-1-2023>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Photometrical requirements	3
4.1 General.....	3
4.2 Front position lamp.....	3
4.2.1 Photometric requirements.....	3
4.2.2 Mode of illumination.....	4
4.3 Rear lamp.....	4
4.3.1 Photometric requirements.....	4
4.3.2 Mode of illumination.....	5
4.4 Stop lamp.....	5
4.4.1 Photometric requirements.....	5
4.4.2 Mode of illumination.....	6
4.5 Low beam.....	7
4.5.1 Photometric requirements.....	7
4.5.2 Mode of illumination.....	8
4.6 High beam.....	8
4.6.1 Photometric requirements.....	8
4.6.2 Mode of illumination.....	9
4.6.3 Additional requirements.....	9
4.7 Direction indicators.....	9
4.7.1 Photometric requirements.....	9
4.7.2 Mode of illumination.....	10
4.8 Stand light.....	10
4.8.1 Photometric requirements.....	10
4.8.2 Mode of illumination.....	11
4.9 Daytime running lamp.....	11
4.9.1 Photometric requirements.....	11
4.9.2 Mode of illumination.....	12
4.9.3 Additional requirements.....	12
5 Colour requirements	12
6 Test methods	13
6.1 General.....	13
6.2 Power supply and light source to test photometrical performances.....	13
6.3 Installation on test bench.....	14
6.4 Measuring of stop lamp activation and deactivation time.....	14
6.4.1 Test preparation and test conditions.....	14
6.4.2 Activation time.....	14
6.4.3 Deactivation time.....	14
Annex A (normative) Measurement of flashing light	15
Annex B (normative) Colour of the light emitted	17
Annex C (informative) Current source	18
Bibliography	19

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 149, *Cycles*, Subcommittee SC 1, *Cycles and major sub-assemblies*.

This fourth edition cancels and replaces the third edition (ISO 6742-1:2015), which has been technically revised.

The main changes are as follows:

- terms and definitions: “continuous light” and “light emitting surface” were added;
- some terms and definitions were reviewed;
- improvement of [Clause 4](#);
- addition of [Table 3](#) in [4.4.2](#);
- addition of [4.9](#) “Daytime running lamp”;
- addition of [6.4](#);
- addition of [Annex C](#).

A list of all parts in the ISO 6742 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Cycles — Lighting and retro-reflective devices —

Part 1: Lighting and light signalling devices

1 Scope

This document is applicable to lighting devices used on cycles intended to be used on public roads and, especially, bicycles complying with ISO 4210^[1] and ISO 8098^[2].

This document specifies the functions, safety requirements, photometric performance and test methods of lighting and signalling devices that can be used on cycles.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6742-4, *Cycles — Lighting and retro-reflective devices — Part 4: Lighting systems powered by the cycle's movement*

ISO 6742-5, *Cycles — Lighting and retro-reflective devices — Part 5: Lighting systems not powered by the cycle's movement*

ISO/CIE 19476, *Characterization of the performance of illuminance meters and luminance meters*

CIE 1931, *XYZ colour space of the International Commission on Illumination*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

front position lamp

lamp emitting a white or an amber light to the front of the cycle, so as to indicate its presence on the road

3.2

headlamp

lamp to light the road to the front of the cycle that has either low beam, high beam or both

3.3

rear lamp

lamp emitting a red light to the rear of the cycle and used to indicate its presence on the road

3.4

stop lamp

lamp used to indicate to other road users that the cycle brakes or significantly decelerates

3.5

low beam

light that illuminates the road in front of the cycle without dazzling other road users from the opposite direction

3.6

high beam

light that illuminates the road for a long distance ahead of the cycles

3.7

direction indicator

lamp used to indicate to other road users that the cyclist intends to change direction to the right or left

3.8

stand light

light emitted by a lamp for a time after the cycle has stopped

3.9

daytime running lamp

lamp facing in forward direction used to make the cycle more easily visible when driving during daytime

3.10

reference axis

characteristic horizontal axis of the lamp, as determined by the manufacturer or by the direction light is emitted with greatest intensity, to serve as a direction of reference during use in service and during test measurements

ISO 6742-1:2023

3.11

H-H line

horizontal line parallel to the ground plane passing through the *reference axis* (3.10)

<https://standards.iteh.ai/catalog/standards/sist/0d9675da-dc30-4e51-a124-eb01d3388fd0/iso-6742-1-2023>

3.12

V-V line

vertical line perpendicular to the ground plane through the *reference axis* (3.10)

3.13

public road

any designated and adopted road, pavement, path, or track on which a cycle is legally permitted to travel and, on most through not all such public roads, cycles will share use with other forms of transport including motorized traffic

[SOURCE: ISO 4210-1:2023, 3.3.3, modified — "bicycle" has been changed to "cycle".]

3.14

short pulse

light flash shorter than 0,2 s

3.15

light source

source of illumination

Note 1 to entry: For example, light bulbs, LEDs and OLEDs.

3.16

continuous light

light with a frequency above 50 Hz

3.17**light emitting surface**

all or part of the exterior surface of the transparent lens that encloses the lighting and light signalling devices and conforms to certain defined photometric and colourimetric conditions

Note 1 to entry: UN/ECE Regulation No.48^[4] shows examples.

[SOURCE: ISO 12509:2023^[3], 3.1.12, modified —Note 1 to entry added.]

4 Photometrical requirements**4.1 General**

If the reference axis is not mentioned by manufacturer, this direction shall be determined by that in which light is emitted with greatest intensity.

Within the field of light distribution, schematically shown as a grid, the light intensity in each direction of a part of the field formed by the grid lines shall meet at least the lowest minimum percentage value being shown on the grid lines surrounding the questioned direction.

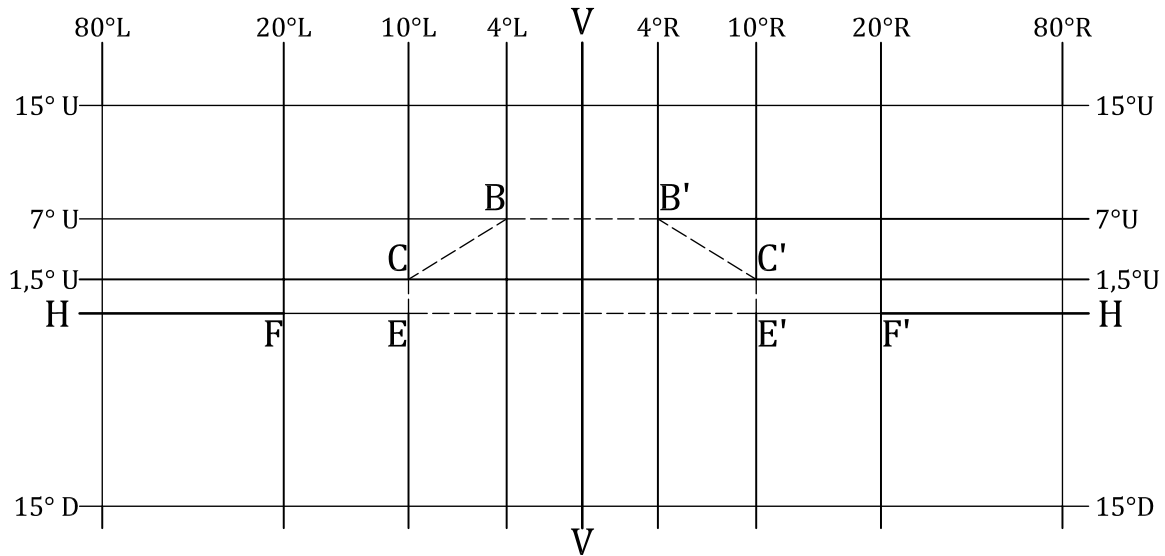
Illuminance and luminance meters shall be calibrated in accordance with ISO/CIE 19476 or equivalent standard.

4.2 Front position lamp**4.2.1 Photometric requirements**

The requirements of the front position lamp contained below in [Table 1](#) shall correspond to the illustrative dimensions as shown further below in [Figure 1](#).

Table 1 — Light distribution for front position lamp

Position	Luminous intensity cd
In area bound by straight lines connecting dots E, C, B, B', C', E' and E	≥4
From E to F and E' to F'	≥2
In rectangular area bounded by lines 15°U, 15°D, 80°L and 80°R	≥0,05
Upper limit on the H-H line and above H-H line	≤140



Key

- B, B', C, C', E, E', F and F' dots indicating areas in [Table 1](#)
- H-H H-H line (See [3.11](#))
- V-V V-V line (See [3.12](#))
- U and D represent the degrees of arc, respectively, above and below the horizontal plane
- L and R represent the degrees of arc, respectively, to the left and right of the vertical plane

Figure 1 — Measuring and aiming screen for front position lamp

ISO 6742-1:2023

4.2.2 Mode of illumination

A front position lamp could either emit a continuous light or flash at a frequency from 1 Hz to 4 Hz. Such a lamp may be capable of only one mode or be switched between modes.

NOTE Some national or regional regulations do not permit the use of flashing lights on pedal cycles, apart from direction indicators.

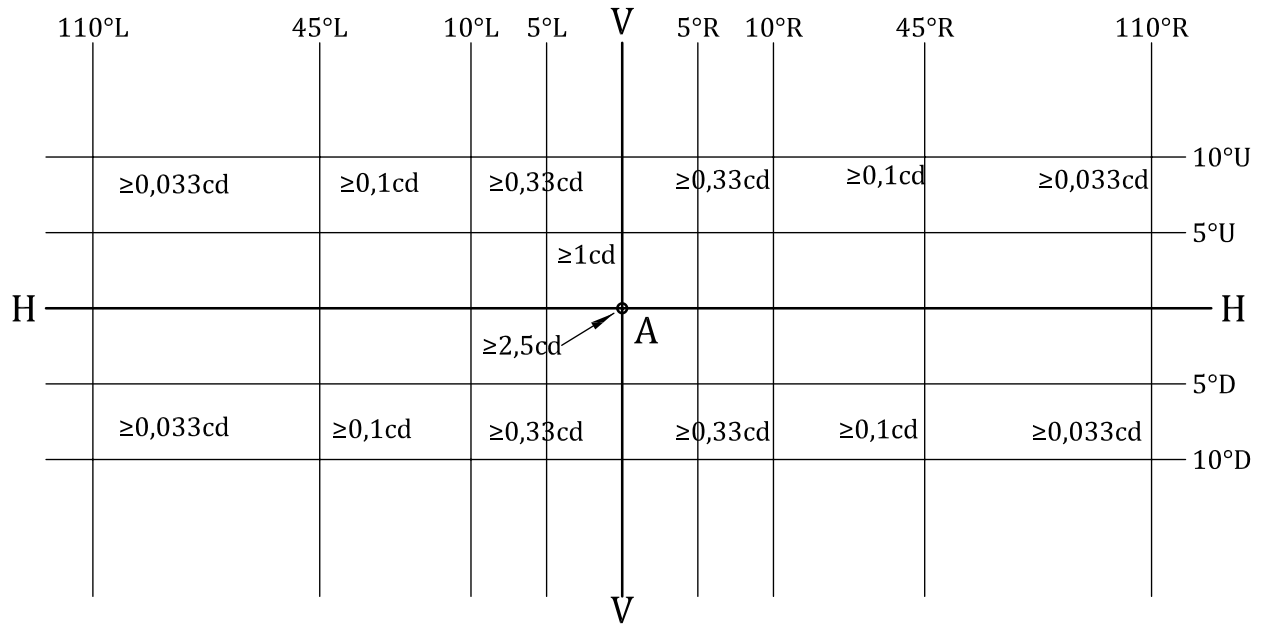
4.3 Rear lamp

4.3.1 Photometric requirements

The requirements of the rear lamp contained in [Table 2](#) shall correspond to the illustrative dimensions as shown further below in [Figure 2](#). Rear lamps with a function of the stand light shall correspond with the requirement of [4.8](#).

Table 2 — Light distribution for rear lamp

Position	Luminous intensity cd
A on intersection of horizontal plane and vertical plane	≥2,5
In rectangular area bounded by lines 5°U, 5°D, 5°L and 5°R	≥1
In rectangular area bounded by lines 10°U, 10°D, 10°L and 10°R	≥0,33
In rectangular area bounded by lines 10°U, 10°D, 45°L and 45°R	≥0,1
In rectangular area bounded by lines 10°U, 10°D, 110°L and 110°R	≥0,033
Upper limit on the H-H line and above H-H line	≤12



Key

- A intersection of horizontal plane and vertical plane (See [Table 2](#))
- H-H H-H line (See [3.11](#))
- V-V V-V line (See [3.12](#))
- U and D represent the degrees of arc, respectively, above and below the horizontal plane
- L and R represent the degrees of arc, respectively, to the left and right of the vertical plane

Figure 2 — Measuring and aiming screen for rear lamp

4.3.2 Mode of illumination

A rear lamp could either emit a continuous light or flash at a frequency from 1 Hz to 4 Hz. Such a lamp may be capable of only one mode or be switched between modes.

NOTE Some national or regional regulations do not permit the use of flashing lights on pedal cycles, apart from direction indicators.

4.4 Stop lamp

4.4.1 Photometric requirements

The minimum intensity measured on the reference V axis at point H = V = 0° of a stop lamp shall be the highest of the following two values, as appropriate:

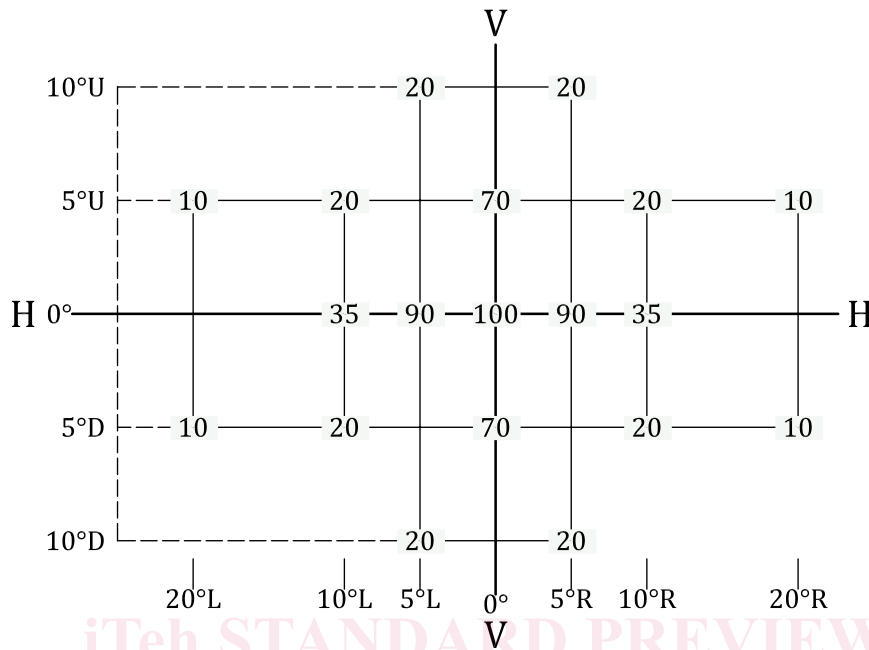
- 40 cd min;
- where a stop lamp function is provided by a rear lamp, at least five times the greatest measurable intensity of the rear lamp.

The greatest measurable intensity of the stop lamp shall not exceed 185 cd.

Light shall be emitted from a stop lamp throughout a zone defined as follows with respect to direction point H = V = 0°: ±45° horizontally and ±15° vertically. Throughout the field of emission the intensity shall not be less than 0,3 cd.

The intensity in specified directions within the grid according to [Figure 3](#) shall be not less than specified percentages of the minimum point $H = V = 0^\circ$ intensity. The angles and percentages relative to the point $H = V = 0^\circ$ direction and value (100 %) are specified in [Figure 3](#).

Values in percent



Key

H-H line (See [3.11](#))

V-V line (See [3.12](#))

U and D represent the degrees of arc, respectively, above and below the horizontal plane

L and R represent the degrees of arc, respectively, to the left and right of the vertical plane

Figure 3 — Light distribution for stop lamp

4.4.2 Mode of illumination

A stop lamp (while stopping) shall emit a continuous light.

The stop lamp shall be operated either by electrical switches incorporated within or attached to the cycles braking system or systems, or shall incorporate a device that operates the stop lamp when the cycle decelerates more rapidly than $(0,6 \pm 0,4) \text{ m/s}^2$ (See [Table 3](#)).

Table 3 — Conditions for activation and deactivation of stop lamps incorporated a device that operates the stop lamp when the cycle decelerates

Deceleration	Activate condition	Activation or deactivation time
During acceleration	Not activated	
Deceleration less than $0,2 \text{ m/s}^2$	Not activated or deactivated	Deactivation time between $0,5 \text{ s}$ and 1 s
Deceleration between $0,2 \text{ m/s}^2$ and 1 m/s^2	At the discretion of the manufacturer	Recommended activation time $0,5 \text{ s}$ or less
Deceleration 1 m/s^2	Activated	Activation time $0,5 \text{ s}$ or less
Deceleration 1 m/s^2 or more	Keep activated	

4.5 Low beam

4.5.1 Photometric requirements

The requirements of the low beam contained in [Table 4](#) shall correspond to the illustrative dimensions as shown further in [Figure 4](#).

Table 4 — Light distribution for low beam

Position	Illumination values ^{abc} lx
On the H-H line and above H-H line	≤ 2
A	$E_A^c \geq 10$
From CL to CR	$E \geq E_A/2$
Vertical line between A to B (included)	If $E_A \leq 20$, $E \geq E_{\max}/2$ If $E_A > 20$, $E \geq 10$
From B to M	If $E_A \leq 20$, $E > 1,5$ If $E_A > 20$, $E > 3$
From FL to FR	If $E_A \leq 20$, $E > 1$ If $E_A > 20$, $E > 2$
From GL to FL and from FR to GR	If $E_A \leq 20$, no requirement If $E_A > 20$, $E > 2$
Area between line 3° down and 4° down And between vertical lines at 4° left and right	$E \leq 1,2 E_A$
Area below line 4° down and between vertical lines at 4° left and right	$E \leq E_A$
<p>^a Values in lux measured on a vertical wall at 10 m ahead from headlamp.</p> <p>^b To make measurements, the cycle light shall be fit in accordance with cycle light manufacturer. If mounting instruction are not clearly defined, there are two possible alternatives:</p> <ul style="list-style-type: none"> — H-H line is the line where the maximum of the illumination is 2 lx; — H-H line is the line 3,5° above the line including E_{\max} (E_{\max} is the maximum illumination). <p>^c E_A is the illumination in point A.</p>	