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Aeronavtika - Letalski sistemi brez posadke - 004. del: Zahteve za razsvetljavo

Aerospace series - Unmanned Aircraft Systems - Part 004: Lighting requirements

Luft- und Raumfahrt - Unbemannte Luftfahrzeugsysteme - Teil 004: Anforderungen an die zu führenden Lichter

Série aérospatiale - Aéronefs télépilotes - Partie 004 : Exigences de signalement lumineux

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49.020	Letala in vesoljska vozila na splošno	Aircraft and space vehicles in general
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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 4709-004

October 2026

ICS 49.020

English Version

**Aerospace series - Unmanned Aircraft Systems - Part 004:
Lighting requirements**

Série aérospatiale - Aéronefs télépilotes - Partie 004 :
Exigences de signalement lumineux

Luft- und Raumfahrt - Unbemannte
Luftfahrzeugsysteme - Teil 004: Anforderungen an die
zu führenden Lichter

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Contents	Page
European foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Lights for controllability	6
4.1 General.....	6
4.2 Performance and design requirements.....	6
4.3 Verification method	7
4.3.1 Requirement (1) – Control mode and lighting indication.....	7
4.3.2 Requirement (2a) – Manual control mode lights	7
4.3.3 Requirement (2b) – Semi-automatic control mode lights	7
4.3.4 Requirement (3) – Presence of the lights for controllability	7
4.3.5 Requirement (4) – Not impairing UA conspicuity at night.....	8
4.4 Pass criteria	8
5 Lights for conspicuity	8
5.1 General.....	8
5.2 Performance and design requirements.....	8
5.3 Verification methods	10
5.3.1 Requirement (1) – Conspicuity light schemes.....	10
5.3.2 Requirement (2) – Removable light installation instructions.....	10
5.3.3 Requirement (3) – Colour specification “green”	11
5.3.4 Requirement (4) – Colour specification “red” and “white” for alternating lights	11
5.3.5 Requirement (5) – Blinking, flashing conspicuity light frequency and cycle rate	11
5.3.6 Requirement (6) – Alternating conspicuity light frequency and cycle rate	13
5.3.7 Requirement (7) – Minimum effective luminous intensity inspection	13
5.3.8 Requirement (8) – Not impair UA controllability	16
5.3.9 Requirement (9) – No light for conspicuity	16
5.4 Pass criteria	17
6 Lights for other purposes	17
6.1 General.....	17
6.2 Performance and design requirements.....	17
6.3 Verification methods	18
6.3.1 Requirement (1) – Not impairing UA conspicuity at night.....	18
6.3.2 Requirement (2) – Add-on light installation instructions	18
6.4 Pass criteria	18
Annex A (informative) Reference implementations	19
Annex B (informative) Guidance for the installation of light(s) for controllability in manual directing and semi-automatic control mode	27
Annex C (informative) Determination of the effective luminous intensity I_e – Part 1	29
Annex D (informative) Determination of the effective luminous intensity I_e – Part 2	33

Annex ZA (informative) Relationship between this document and the essential requirements of Delegated regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems aimed to be covered.....	35
Bibliography	36

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European foreword

This document (EN 4709-004:2026) has been prepared by CEN/TC 471 “Unmanned aircraft systems”, the secretariat of which is held by BNAE.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2027, and conflicting national standards shall be withdrawn at the latest by April 2027.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation(s).

For relationship with EU Regulation(s), see informative Annex ZA, which is an integral part of this document.

A list of all parts in the 4709 series can be found on the CEN website: www.cencenelec.eu.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

This document will provide means of compliance to cover lighting related requirements for Parts 2 to 4 of the Annex to the Commission Delegated Regulation (EU) 2019/945 on unmanned aircraft and on third country UAS operators.

The purpose is to be able to verify that an UA is equipped with lights:

- for the controllability of the UA (the effectiveness of those lights is not part of the lighting requirement but is covered by the controllability requirement; therefore, its verification is covered by the clause addressing the controllability requirement of EN 4709-001:2026);
- that ensure conspicuity of the unmanned aircraft at night (see 3.45 of ISO 21384-4:2025), the design of the light shall allow a person on the ground to distinguish a UA from a manned aircraft.

This document addresses:

- definition of types, technical requirements, and technical parameters of UA lights (e.g. position of lights for different UA categories, intensity for different operation modes);
- definition of purpose, test procedures, requirements, and compliance rules to evaluate UA lights.

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.

EN 4709-001:2026, *Aerospace series — Unmanned Aircraft Systems — Part 001: Product requirements and verification*

ISO 21384-4:2025, *Uncrewed Aircraft Systems — Part 4: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4709-001:2026, ISO 21384-4:2025 and the following apply.

ISO and IEC maintain terminology 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

effective frequency

frequency at which the UA complete light for conspicuity system is observed from a distance and applies to each sector of flight including any overlaps that exist when the system consists of more than one light source

Note 1 to entry: it is measured in cycle per minute.

3.2

on-time

time the conspicuity light emits light

Note 1 to entry: it is denoted as t_{on} and is measured in seconds.

EN 4709-004:2026 (E)**3.3****off-time**

time the conspicuity light does not emit light

Note 1 to entry: it is denoted as t_{off} and is measured in seconds.

3.4**add-on light**

light for conspicuity that can be attached to the main structure of the UA and is provided in any packaging configurations in which the UAS is placed on the market

4 Lights for controllability**4.1 General**

Lights for controllability shall be provided when needed i.e. if at least one of the authorized flight conditions requires their use.

They shall provide the remote pilot with sufficient information about the UA (e.g. position, attitude, and heading) to ensure its controllability at night, in the control mode and flight conditions specified by the manufacturer.

Lights for controllability can be removable but shall be provided in any packaging configurations in which the UAS is placed on the market.

NOTE The requirement for the presence of controllability lights is defined by the manufacturer in accordance with the controllability requirements in EN 4709-001:2026.

Annex A provides additional guidance of acceptable light positions according to types and size of UA.

Annex B provides guidance on how to install light(s) for controllability in manual direct piloting control mode.

4.2 Performance and design requirements

- (1) The manufacturer shall declare in the manufacturer's instructions the mode(s) of control of the UA in every authorized flight condition including the purpose of the lights installed on the UA to support its controllability.

NOTE If the UA switches to manual mode in case of emergencies or abnormal function, lighting requirements for manual mode are required even when the UA is operated in semi-automatic or automatic mode.

(2)

- a. If the UA features a manual mode, the UA shall be equipped with lights for controllability to indicate:
- attitude;
 - heading; and
 - position;

of the UA in every flight condition for which the lights for controllability are deemed necessary by the manufacturer to ensure the controllability of the UA.

- b. If the UA features a semi-automatic control mode, the UA shall be equipped with lights for controllability to indicate at least:
 - heading; and
 - position;

of the UA in every flight condition for which the lights for controllability are deemed necessary by the manufacturer to ensure the controllability of the UA.

- (3) The UA shall be equipped with lights for controllability if any of the authorized flight conditions deems these lights to be necessary.
- (4) Lights for controllability shall not impair the UA conspicuity light system to maintain the conspicuity of the UA at night given in 5.2 (7).

4.3 Verification method

4.3.1 Requirement (1) – Control mode and lighting indication

Verify in the manufacturer's instructions that the *mode of control* for the UA for every flight condition, including the purpose of the lights has been determined by the manufacturer.

4.3.2 Requirement (2a) – Manual control mode lights

For manual control mode UAS: verify in the manufacturer's instruction that the lights for controllability indicate:

- attitude;
- heading; and
- position;

of the UA.

4.3.3 Requirement (2b) – Semi-automatic control mode lights

For semi-automatic control mode UAS: verify in the manufacturer's instruction that the lights for controllability indicate:

- heading; and
- position;

of the UA.

4.3.4 Requirement (3) – Presence of the lights for controllability

In the event that any of the flight conditions authorized by the manufacturer in the manufacturer's instructions require the use of lights to ensure the safe controllability of the UA, verify by design that lights for controllability as per 4.3.2 or 4.3.3 are integrated on the UA.

NOTE Annex A provides reference implementation of lights for controllability.