



SLOVENSKI STANDARD
oSIST prEN 4709-001:2019
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Aeronavtika - Letalski sistemi brez posadke - Zahteve za proizvod in preverjanje proizvodov za odprto kategorijo

Aerospace series - Unmanned Aircraft Systems - Product requirements and verification for the Open category

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Aerospace series - Unmanned Aircraft Systems - Product requirements and verification for the Open category

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 4709-001:2019) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

This document was originally reviewed by the Domain Technical Coordinator of ASD-STAN's Autonomous flying Domain.

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Introduction

EASA published on February 6, 2018 the Opinion No 01/2018 “Introduction of a regulatory framework for the operation of unmanned aircraft systems in the ‘open’ and ‘specific’ categories”.

Many organizations are involved in developing a range of general technical standards for electrical safety, EMC, environmental and also a range of other standards to be applied to specific applications. For UAS the picture is complex but an acceptable means of compliance can be completed with existing technical standards and the use of electrical components that are intended to be incorporated into equipment and for which a risk assessment can be undertaken.

This European Standard gives all Economic Operators (such as manufacturers, importers and distributors and their trade associations as well as bodies involved in the conformity assessment procedures) a viable way to prove compliance with the requirements laid out in the Opinion No 01/2018 and find commonality in compliance methods.

It is the manufacturer’s responsibility to determine, based on his risk assessment, whether the risk is acceptable. With regard to what is an acceptable level of risk for a product, this is determined by the compliance with the safety objectives defined in Opinion No 01/2018.

The end user of this document assumes all responsibility for the safe application of these test methods. All relevant safety/quality procedures should be taken into account. Special consideration should be considered when operating the UAS for evaluations. All local, state, federal, and country laws should be taken into account when operating UAS.

For repeatability, it is assumed that environmental conditions (temperature, wind, pressure, humidity) are recorded during any tests and it is further assumed tests conducted unless otherwise noted within the following conditions: Temperature – 18-28 C, Pressure – Atmospheric from sea level up to 2 000 m, Humidity – 10-60 %, Wind Speed – Calm (less than 0,3 m/s or zero on the Beaufort Scale).

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prEN 4709-001:2019 (E)**1 Scope**

This document provides means of compliance with Parts 1 to 6 of Commission delegated (EU) .../... of XXX on making available on the market of unmanned aircraft intended for use in the 'open' category and on third-country UAS operators proposed in the Opinion 01/2018.

This includes compliance with product requirements for all UAS authorized to operate in the 'open' category (class C0, C1, C2, C3 and C4 UAS) and the electronic identification system.

This document does not cover "Specific" or "Certified" category of UAS.

Compliance with this document assists in complying with CE marking technical requirements and covers, but is not limited to:

- I. Physical and mechanical properties;
- II. Flammability;
- III. Electrical properties;
- IV. Functional Safety.

This European Standard is only applicable for UA with energy sources based on electro-chemical technologies.

Additional hazards that occur from the characteristics of the payload are excluded and are under the responsibility of the manufacturer and operator.

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 71-1:2014+A1:2018, *Safety of toys — Part 1: Mechanical and physical properties*

EN 55032, *Electromagnetic compatibility of multimedia equipment — Emission Requirements (CISPR 32)*

EN 60825-1, *Safety of laser products — Part 1: Equipment classification and requirements (IEC 60825-1)*

EN 61959, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Mechanical tests for sealed portable secondary cells and batteries (IEC 61959)*

EN 62133-1, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications — Part 1: Nickel systems (IEC 62133-1)*

EN 62133-2, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications — Part 2: Lithium systems (IEC 62133-2)*

EN 62368-1:2014, *Audio/video, information and communication technology equipment — Part 1: Safety requirements (IEC 62368-1:2014, modified)*

ETSI EN 300 328, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band*

modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

ETSI EN 301 893, *Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*

EN ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744)*

EN ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746)*

IEC 62471, *Photobiological safety of lamps and lamp systems*

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:

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

3.1

Abbreviated Injury Scale

AIS

anatomically based coding system created by the Association for the Advancement of Automotive Medicine to classify and describe the severity of injuries

3.2

automatic flight

flight following preprogrammed instructions, loaded in the unmanned aircraft (UA) flight control system that the UA executes

3.3

Open category

category of UAS operation that, considering the low risk involved, requires neither a prior authorization by the competent authority nor a declaration by the UAS operator before the operation takes place

3.4

specific category

category of UAS operation that, considering the risks involved, requires an authorization by the competent authority before the operation takes place and takes into account the mitigation measures identified in an operational risk assessment, except for certain standard scenarios where a declaration by the operator is sufficient

3.5

certified category

category of UAS operation that, considering the risks involved, requires the certification of the UA, a licensed remote pilot and an operator approved by the competent authority, in order to ensure an appropriate level of safety

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applicable to the coverage of injuries
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prEN 4709-001:2019 (E)**3.6****competent authority**

authority responsible for the certification, authorization and oversight of UAS air operations in the Member State where the UAS operator has its principal place of business or place of residence

3.7**direct remote electronic identification**

system that broadcasts the identity of the UA so that it can be directly received by existing mobile devices within the broadcasting range

3.8**follow-me mode**

mode of operation of a UAS where the UA constantly follows a person or a device within a predetermined radius

3.9**geo-awareness**

function that can detect a potential breach of airspace limitations and provide the remote pilot with sufficient information and an appropriate alert to allow the remote pilot to take effective action to prevent that breach

3.10**hazard**

condition or an object with the potential to cause injuries, damage, loss of material or a reduction of the ability to perform a prescribed function

3.11**Maximum Take-Off Mass****MTOM**

maximum take-off mass of the UA, including payload

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3.12**unmanned aircraft system operator**

legal or natural person who operates or intends to operate one or more UAS

3.13**remote pilot**

natural person responsible for safely conducting the flight of a UA by operating its flight controls, either manually or, when the UA flies automatically, by monitoring its course and remaining able to intervene and change its course at any time

3.14**return home**

fail safe system that upon loss of data link will direct the UA back to predefined home position

3.15**Remote Pilot Station****RPS**

component of the UAS containing the equipment used to control the UA

3.16**standard scenario**

description of a type of operation included in a certification specification issued by EASA, for which a specific operations risk assessment (SORA) has been conducted

3.17**Unmanned Aircraft****UA**

aircraft operating or designed to operate autonomously or to be piloted remotely without a pilot on board

3.18**Unmanned Aircraft System****UAS**

Unmanned Aircraft and its associated elements which are operated with no pilot on board

Note 1 to entry: ISO/CD 21384-2.

3.19**Visual Line Of Sight****VLOS**

type of operation in which the remote pilot maintains continuous unobstructed and unaided visual contact with the UA, allowing the remote pilot to monitor the flight path of the UA in relation to other aircraft, persons, and obstacles, for the purpose of maintaining separation from them and avoiding collisions

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3.20**equipment to control unmanned aircraft remotely**

instrument, equipment, mechanism, apparatus, appurtenance, software or accessory that is necessary for the safe operation of a UA, other than a part, and which is not carried on board that UA

3.21**payload**

additional load (cargo or equipment) a vehicle carries that is not required to operate the UA

3.22**operating empty mass**

basic weight of an UA, including all equipment necessary to operate the UA (excluding payload)

4 Product Requirements and Compliance for Class 0 UAS**4.1 MTOM**

The UAS shall have a maximum take-off mass of 250 g (9 oz).

Compliance is checked by verifying the mass of the airframe, configured with all available options (or the heaviest combination), is 250 g or less.

Details for payloads are given in 9.4.