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**Unmanned aircraft systems —**

**Part 2:**

**Operation of vertiports for vertical  
take-off and landing (VTOL)  
unmanned aircraft (UA)**

*Aéronefs sans pilote —*

*Partie 2: Exploitation des vertiports pour les aéronefs télépilotes (UA)  
à décollage et atterrissage vertical (VTOL)*



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

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## 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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 16, *Unmanned aircraft systems*.

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](http://www.iso.org/members.html).

# Introduction

## 0.1 General

This document belongs to a series of International Standards related to vertiport infrastructures and operations, developed by ISO/TC 20, SC 16 and SC 17.

A related standard under development by TC 20 is ISO 5491<sup>1)</sup>[1].

## 0.2 Background

Vertiport operations relate to landing, ground movement, parking, and subsequent take-off and departure of vertical take-off and landing (VTOL) aircraft, electrically powered (eVTOL) or equipped with other propulsion systems. In this document, the abbreviated term VTOL encompasses eVTOL.

Vertiport operations also comprise ground handling and servicing, including energy replenishment.

Maintenance and operations of VTOL unmanned aircraft (UA), as well as UAS traffic management (UTM) services, are not covered by this document, although the vertiport operator often needs to exchange information with both the unmanned aircraft system (UAS) or operators of VTOL aircraft and UTM service providers (UTM SPs).

UTM SP are also called, in different regions of the world, “providers of services for UAM (PSU)” or “U-space service providers (USSP)”. These terms are equivalent in this document.

This document hence focuses on the requirements applicable to the vertiport operator for the safety, security and compliance of the provided services, as well as protection of related data and information. These requirements include organizational structure, accountabilities, policies and procedures.

A vertiport operator contributes to the safety, security and efficiency of operations of UAS or other VTOL aircraft suitable for operations over urban areas, supporting the fulfilment of the responsibilities of the UAS or VTOL aircraft operator. Operational procedures and requirements for the UAS operator are contained in ISO 21384-3[2]. Although vertiport operations are established considering the needs of VTOL UA, these services can also support operations of properly equipped manned VTOL aircraft.

These VTOL aircraft can be employed for aerial work or transport, including of passengers.

One organization can operate several vertiports at different locations.

## 0.3 Types of vertiports

Vertiport operations relate to landing, ground movement, parking and subsequent take-off and departure of VTOL aircraft, electrically powered or equipped with other propulsion systems.

Vertiport operations also comprise cargo and passenger ground handling and aircraft servicing (e.g. power supply), including energy replenishment (e.g. battery recharging or refuelling).

The vertiports can be open to international or domestic public use or for private use.

The vertiports can be certified or licensed by the competent authority, based on applicable legislation.

Vertiports can be distinguished as type A (micro, used for logistics or for energy replenishment) and type B [small vertiports, including for urban air mobility (UAM) mainly of passengers], both serving aircraft capable of VTOL, including electrically powered, with a maximum take-off mass (MTOM) of up to 150 kg and 3 175 kg, respectively (i.e. 7 000 lbs.).

Large vertiports in type C are essentially heliports designed primarily to serve large rotorcraft equipped with internal combustion engines. But, when complemented by additional specific equipment or provisions, type C vertiports can also serve electrically powered manned or unmanned VTOL aircraft.

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1) Under preparation. Stage at the time of publication: ISO/DIS 5491:2022.

These three types are summarized in [Table 1](#).

**Table 1 — Types of vertiports**

| Vertiport type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | A<br>(micro)                               | B<br>(small)                                 | C<br>(large)                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------|
| Serving unmanned VTOL aircraft with features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            |                                              |                                                                                           |
| MTOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 150 kg                                     | 3 175 kg (7 000 lbs)                         | unlimited                                                                                 |
| Maximum passenger number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                                          | 9                                            | unlimited                                                                                 |
| Normal (V <sub>no</sub> ) or maximum operating (V <sub>mo</sub> ) speed                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 80 km/h (80 kn calibrated airspeed (KCAS)) | 460 km/h (250 KCAS) during horizontal cruise | unlimited                                                                                 |
| Pressurized cabin or compartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No                                         | No                                           | possibly                                                                                  |
| Related vertiport infrastructure and equipment standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ISO 5491 <sup>[1]</sup>                    | TBD                                          | Several standards produced by ISO TC 20, in particular for ground support equipment (GSE) |
| NOTE 1 Type A vertiports can be portable or fixed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                            |                                              |                                                                                           |
| NOTE 2 Type A vertiports are intended for logistics applications including inside urban areas. Type B vertiports can also serve passenger-carrying VTOL aircraft, including traditional rotorcraft specified in EASA/FAA CS/FAR 27 <sup>[3][4]</sup> . Type C vertiports are intended to serve VTOL aircraft of any mass, including large rotorcraft. Limitations for users can derive from environmental regulations (e.g. noise) or from decisions by the vertiport operator (e.g. provide or not refuelling facilities). |                                            |                                              |                                                                                           |
| NOTE 3 Type A vertiports are intended to serve UA of MTOM up to level V in paragraph 6 of ISO 21895 <sup>[5]</sup> .                                                                                                                                                                                                                                                                                                                                                                                                        |                                            |                                              |                                                                                           |
| NOTE 4 3 175 kg MTOM is consistent with the threshold separating small rotorcraft from large rotorcraft, the former in FAR/CS 27 <sup>[3][4]</sup> and the latter in FAR/CS 29 <sup>[6][2]</sup> . Furthermore, nine is the maximum number of passengers allowed under FAR/CS-27 <sup>[3][4]</sup> .                                                                                                                                                                                                                        |                                            |                                              |                                                                                           |
| NOTE 5 ISO 5491 <sup>[1]</sup> provides standards for the exchange of digital information between the vertiport and the UA.                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |                                              |                                                                                           |

## 0.5 Content of this document

This document contains requirements that can be used by an organization to provide safe, secure and efficient vertiport operations.

This document includes requirements on qualification and training of personnel, vertiport operation, maintenance, and competence of vertiport maintenance and of ground handling staff as well as noise around the vertiport and organizational requirements including occurrence reporting and safety, security and privacy.

This document does not include requirements specific to other topics, such as those for quality, occupational health and safety (OH&S), social responsibility, environmental matters beyond noise or financial management, or use of the electro-magnetic spectrum, though its elements can be aligned or integrated with those of other management systems.

In this document, the following verbal forms are used:

- a) “shall” indicates a requirement;
- b) “should” indicates a recommendation;
- c) “may” indicates a permission;
- d) “can” indicates a possibility or a capability.

Information marked as “NOTE” is for guidance in understanding or clarifying the associated requirement.

# Unmanned aircraft systems —

## Part 2:

## Operation of vertiports for vertical take-off and landing (VTOL) unmanned aircraft (UA)

### 1 Scope

This document specifies the requirements for vertiport operations (e.g. removal of contaminants, noise) and interface with an unmanned aircraft system (UAS) or vertical take-off and landing (VTOL) aircraft operators and with UAS traffic management (UTM) service providers (SPs).

This document is applicable to operations of vertiports belonging to any type, supporting:

- a) demonstration of compliance with applicable regulations of vertiport operations to aviation authorities or other public authorities, as a possible acceptable means of compliance (AMC), when applicable regulations require such involvement from the authority and when the authority considers this document acceptable;
- b) attestation of compliance of vertiport operations by qualified entities or other accredited, competent and independent third parties, supporting the safety risk assessment of the UAS operations required by regulations, in particular when high level of assurance robustness is required;
- c) attestation of compliance of vertiport operations by qualified entities or other accredited, competent and independent third parties even in the absence of any applicable regulation.

This document also covers safety of the vertiport operator and quality of data provided by the vertiport operator to other entities (e.g. UAS operators, service providers of aeronautical information, providers of UTM services).

Aspects that are not covered by this document are:

- requirements for operational procedures of UAS;
- requirements for physical characteristics and equipment for vertiports;
- requirements for UTM SPs.

### 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 21384-4, *Unmanned aircraft systems — Part 4: Vocabulary*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21384-4 and the following apply.