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## Categorization and classification of civil unmanned aircraft systems

*Catégorisation et classification des aéronefs civils sans pilote*

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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

This document sets out a methodology for the multi-dimensional classification of unmanned aircraft system (UAS). The purpose of this classification model is not to replace any existing regulatory model but to provide a more granular classification tool for use by those who need to approach the classification of UAS from their own perspective and for whom the regulatory model is too broad. Examples may be but are not limited to; engineers, manufacturers, certification bodies, insurance underwriters or accident investigators.

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# Categorization and classification of civil unmanned aircraft systems

## 1 Scope

This document specifies requirements for the classification and grading of civil unmanned aircraft system (UAS). This document applies to heavier than air aircraft as well as lighter than air aircraft of any possible architecture.

This document applies to the industrial conception, development, design, production and delivery of civil UAS. It also applies to modification, repair and maintenance of civil UAS.

The characteristics in this document can be used individually or in combination, to meet specific needs of the classification and grading of civil UAS.

Risk-based categorization of UAS operations is prerogative of the aviation authorities and it is hence out of scope of this document.

## 2 Normative references

The following document is 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<sup>1)</sup>, *Unmanned aircraft systems — Part 4: Vocabulary*  
<https://standards.iteh.ai/catalog/standards/sist/c246db0b-e857-4b00-8591-adf1bad5255a/iso-21895-2020>

## 3 Terms and definitions

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

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

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

### 3.1 multicopter

rotorcraft lifted by more than two power driven rotors on substantially vertical axis

### 3.2 aerostat

lighter than air aircraft

## 4 Classification and grading principle

Civil UAS classification is proposed from different viewpoints, which are subsequently categorized and graded against a stakeholder specific rule set. The framework provides a valuable tool for all stakeholders in the industry to categorize UAS from their perspective and the perspective of others.

[Figure 1](#) shows a conceptual structure of the UAS classification framework.

1) Under preparation. Stage at the time of publication: ISO/DIS 21384-4:2019.

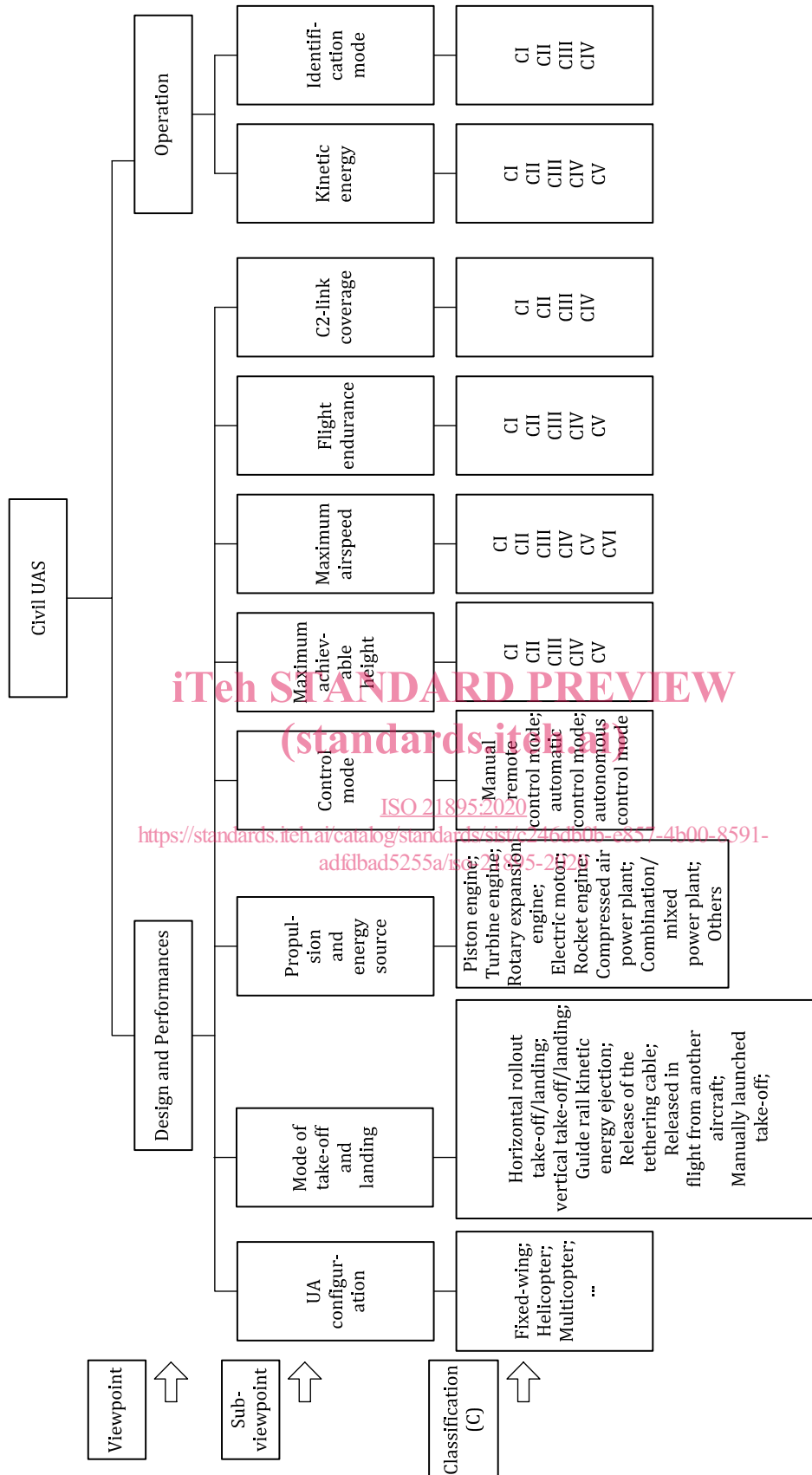


Figure 1 — Civil UAS classification framework

Figure 2 shows an example for grading framework under fixed wing, helicopter and multicopter.



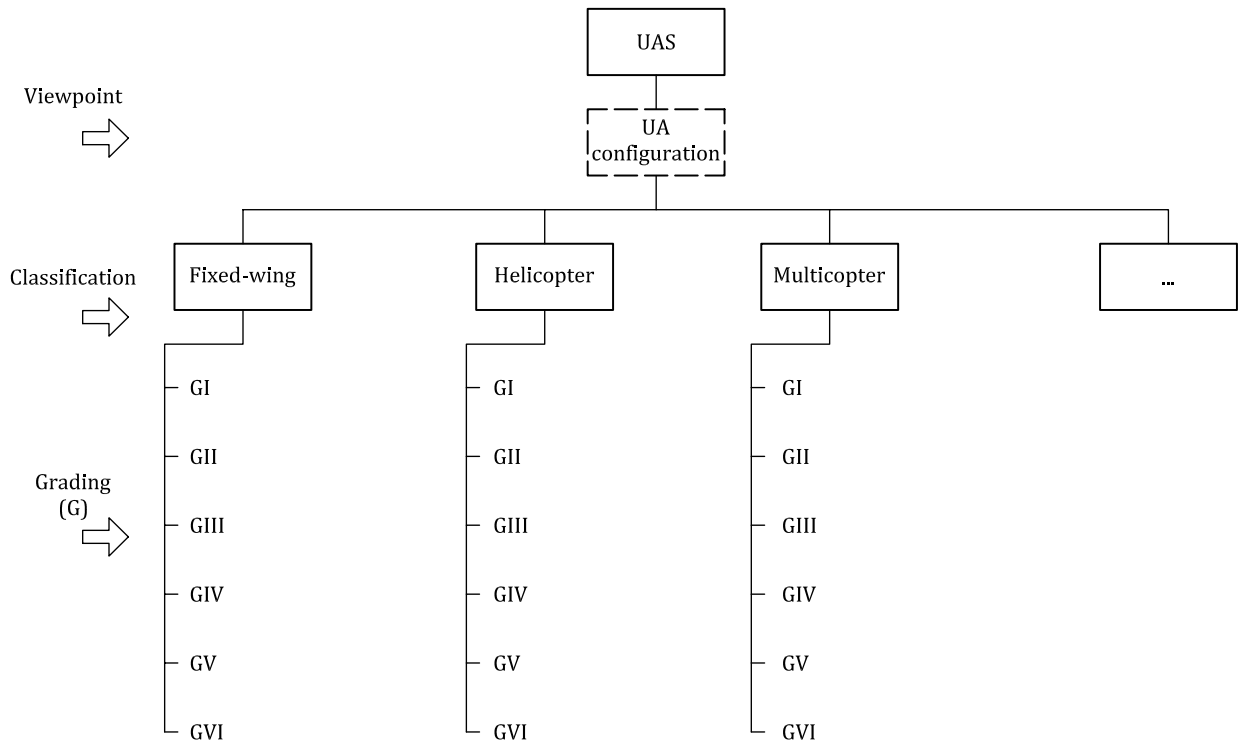


Figure 2 — Example for grading framework under fixed-wing, helicopter and multicopter

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## 5 Classification

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### 5.1 UA-configuration

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According to the UA-configuration, an unmanned aircraft (UA) shall be classified as follows:

- a) powered fixed-wing plane (or aeroplane);
- b) glider;
- c) single rotor helicopter;
- d) multicopter;
- e) gyroplane;
- f) parawing, flapping-wing (ornithopter) and other bio-inspired aircraft;
- g) vertical take-off and landing (VTOL), other than helicopter or multicopter;
- h) airships;
- i) tethered or free aerostatic balloons;
- j) tethered heavier than air aircraft (e.g. kites);
- k) aerostat;
- l) others.