

**TR 101:2022**  
(ICS 49.020)

TECHNICAL REFERENCE

**Guidelines on airworthiness of unmanned  
aircraft systems (UAS)**

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## Foreword

This Technical Reference (TR) was prepared by the Working Group on Unmanned Aircraft Systems Manufacturing set up by the Technical Committee on Aerospace under the purview of the Manufacturing Standards Committee.

This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

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# Guidelines on airworthiness of unmanned aircraft systems (UAS)

## 0 Introduction

With the increased popularity of unmanned aircraft systems (UAS) or drones in Singapore, the general public can purchase and pilot commercial UAS easily.

There are still airworthiness concerns in UAS operations.

These concerns are as follows:

- a) UAS licensed users may find the requirements for airworthiness non-prescriptive.
- b) UAS operations have diversified into many types of applications, i.e. from aerial surveillance to parcel deliveries. There is a growing need to develop a set of baseline UAS airworthiness guidelines to facilitate the complex UAS operations in Singapore's urban environment.

It is with this intent that this TR is developed to address these concerns.

The guidelines described in this TR should be conducted safely and with due consideration for the public.

## 1 Scope

This TR contains a set of technical guidelines intended primarily for the airworthiness verification of multi-rotor UAS with a maximum take-off mass (MTOM) between 1.5 kg and 25 kg that are operated outdoors under the following conditions:

- a) Within visual line-of-sight or extended visual line-of-sight;
- b) Within segregated airspace at an altitude not exceeding 200 ft (60 m). above ground level (AGL), and outside 5 km of aerodromes;
- c) During the daytime;
- d) Single operator to single UAS direct command and control only; and
- e) No over-flying of public or uninvolved personnel.

This TR does not cover unmanned aircraft (UA) with a MTOM of less than 1.5 kg because there is a consensus that UA below this mass generally pose lesser safety risk.

The following are not covered in this TR:

- a) Airworthiness verification guidelines for fixed-wing aeroplane and powered-lift UAS;
- b) Night-time operations;
- c) Fully autonomous operations;
- d) Beyond visual line-of-sight operations;
- e) Operations within non-segregated and controlled airspace;
- f) Cybersecurity requirements.