



BSI Standards Publication

Experiment results on test methods for detection and avoidance (DAA) systems for unmanned aircraft systems

National foreword

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Technical Report

ISO/TR 23267

Experiment results on test methods for detection and avoidance (DAA) systems for unmanned aircraft systems

*Résultats d'expériences sur les méthodes de test des systèmes
de détection et d'évitement (DAA) pour les systèmes d'aéronefs
télépilotes*

**First edition
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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test subject	1
5 Evaluation and test method	1
5.1 General	1
5.2 Type of detection and avoidance	1
6 Test item	2
6.1 General	2
6.2 Modelling and simulation	2
6.2.1 General	2
6.2.2 Modelling	2
6.2.3 Simulation	2
6.3 Equipment test	2
6.4 Flight test	3
6.4.1 General	3
6.4.2 Hardware and software used for each operational step	3
6.4.3 Range	4
Annex A (informative) Modelling and simulation	5
Annex B (informative) Equipment test	6
Annex C (informative) Flight test between UAS and manned aircraft, relative speed of 100 km/h	10
Annex D (informative) Flight test between UAS and manned aircraft, relative speed of 200 km/h	12
Annex E (informative) Flight test between UAS and UAS, relative speed of 100 km/h	14
Bibliography	15

Foreword

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Introduction

With rapid technological advancements, unmanned aerial systems (UAS) technology is continuing to become more autonomous in operation and accessible to consumers. Today, the use of UAS technology is not only prevalent for entertainment purposes but also extending into more various industrial applications such as logistics, disaster relief, powerline inspection. There is an increasing number of UAS operations in low altitude airspace where the safety considerations can be quite complex, especially in the context of urban areas. All types of UAS operating in such areas must be able to avoid ground obstacles like high-rise buildings, cranes, public utilities such as power grid and mobile network antennas, along with airspace users that share the same airspace such as low-flying helicopters, UASs and kites. Micro-weather patterns also pose a challenge by bringing about uncertainty, invisibility, and unpredictability.

A detection and avoidance (DAA) system is one of the key onboard systems to address these challenges. By sensing the surrounding situations, the DAA system can examine the size and distance of a particular obstacle, apply trajectory planning, and then calculate the possibility of collision. It orders the flight control system to make UAS slow down, fully stop or completely offset the obstacle in a fully autonomous manner. The function and performance of the DAA system is closely related to its safety speed, which has a direct impact on the scope of UAS. Failure detection also causes instability and unexpected braking.

A related document about the DAA system, ISO 15964, is currently under development and will focus on the standardization of hardware and software of each component of DAA such as sensors, computers, and interfaces. There is an expectation that there will be further work to standardize the test and evaluation methodologies of DAA capability to ensure that operators' safety and quality meet the minimum requirements, specifically for on-board/off-board DAA systems.

To achieve a safe and secure operating environment, it is significant to develop a technical report that provides examples for test results for the safety and quality of DAA systems. This document will offer reference to latest, detailed real-world applications of modelling and simulation, equipment tests, and flight tests.

