
Space systems — Magnetic testing

Systèmes spatiaux — Essais magnétiques



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Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	3
5 Requirements	3
5.1 EUT requirements	3
5.2 Test requirements	4
6 Test items	4
7 Test room environments	5
8 Magnetic field test methods	5
8.1 Test purpose	5
8.2 Test facilities	5
8.3 Procedures for magnetic field test	6
9 Magnetic moment test methods	6
9.1 Test purpose	6
9.2 Test facilities	6
9.3 Procedures and calculating formulas for magnetic moment test	7
9.4 Magnetic moment test in the geomagnetic field	7
10 Magnetization and demagnetization test methods	7
10.1 Test purpose	7
10.2 Test facilities	7
10.3 Procedures for magnetization and demagnetization test	8
11 Magnetic compensation test method	8
11.1 Test purpose	8
11.2 Procedures for magnetic compensation test	9
12 Test report	9
Annex A (informative) Procedures for a magnetic field test	10
Annex B (informative) Procedures and calculating formulas for a magnetic moment test	13
Annex C (informative) Procedures for a magnetization and demagnetization test	24
Annex D (informative) Procedures for a magnetic compensation test	26
Bibliography	27

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).

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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.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

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.

Introduction

The magnetic torque, which is created by the interaction between a geomagnetic field and the remnant magnetic moment of the spacecraft, has considerable disturbance on the flight attitude of the spacecraft. The magnetic field of the spacecraft itself will affect a magnetometer scientific payload sensitive to spacecraft-induced magnetic fields. Thus, magnetic tests on Earth-orbiting or interplanetary spacecraft missions with very stringent requirements on magnetic cleanliness are needed in order to ensure that the spacecraft's inherent magnetic properties meet the design goals.

This document provides magnetic test requirements and methods for measuring and evaluating magnetic properties of the spacecraft. The magnetic test methods outlined in this requirements document are effective enough to verify the compliance of magnetic requirements imposed on the spacecraft and to ensure the success of spacecraft flight missions free of magnetic interference and magnetic contamination due to magnetic materials and induced current-generated magnetic fields of the spacecraft.

Space systems — Magnetic testing

1 Scope

This document specifies magnetic test methods including magnetic field test methods, magnetic moment test methods, magnetization and demagnetization test methods and magnetic compensation test methods. This document is applicable to magnetic tests on several levels: spacecraft-level, subsystem-level and unit-level.

This document gives guidelines for conducting magnetic tests both in zero-magnetic field environment provided by magnetic test facilities and in the presence of the geomagnetic field environment.

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 14644-1, *Cleanrooms and associated controlled environments — Part 1: Classification of air cleanliness by particle concentration*

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

3.1

equipment under test

EUT

object under the magnetic test on system, subsystem or unit level generally

3.2

remnant magnetic moment

magnetic moment of the EUT in a zero-magnetic field environment when the EUT is not in a powered on operational mode, that is mostly due to the residual magnetic fields from spacecraft materials

3.3

stray magnetic moment

magnetic moment of the EUT in zero-magnetic field environment when the EUT is in a powered on operational mode

3.4

induced magnetic moment

additional magnetic moment of the EUT generated in an external magnetic field environment when the EUT is not in a powered on operational mode, that is mostly due to soft magnetic materials that easily magnetize in an external magnetic field