INTERNATIONAL STANDARD

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Space systems — Safety and compatibility of materials —

Part 4:
Determination of upward flammability of materials in pressurized gaseous oxygen or oxygen-enriched environments

Systèmes spatiaux — Sécurité et compatibilité des matériaux —

Partie 4: Détermination de l'inflammabilité verticale des matériaux dans des environnements d'oxygène gazeux pressurisé ou enrichis en oxygène

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14624-4 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

ISO 14624 consists of the following parts, under the general title *Space systems — Safety and compatibility of materials*:

- *Part 1: Determination of upward flammability of materials*
- *Part 2: Determination of flammability of electrical-wire insulation and accessory materials*
- *Part 3: Determination of offgassed products from materials and assembled articles*
- *Part 4: Determination of upward flammability of materials in pressurized gaseous oxygen or oxygen-enriched environments*
- *Part 5: Determination of reactivity of materials with aerospace propellants*
- *Part 6: Determination of reactivity of processing materials with aerospace fluids*
- *Part 7: Determination of permeability of materials to aerospace fluids*

Introduction

Throughout this part of ISO 14624, the minimum essential criteria are identified by the use of the imperative or the key word “shall”. Recommended criteria are identified by the use of the key word “should” and, while not mandatory, are considered to be of primary importance in providing serviceable, economical and practical designs. Deviations from the recommended criteria may be made only after careful consideration, extensive testing and thorough service evaluation have shown an alternative method to be satisfactory.

Space systems — Safety and compatibility of materials —

Part 4:
Determination of upward flammability of materials in pressurized gaseous oxygen or oxygen-enriched environments

1 Scope

This part of ISO 14624 specifies a test method for determining the flammability of aerospace materials in pressurized gaseous oxygen (GOX) and oxygen-enriched environments, at ambient temperature. This method may also be used to provide supplementary information by testing at pressures other than the intended use pressure (see Clause 4). The standard pressure range for this test method is from ambient to 69 000 kPa.

2 Conformance

The tests shall be performed in an accredited test facility (see Annex A for guidelines).

The authority having jurisdiction, or the test requester, shall provide properly identified material(s) for testing. Alternatively, accredited test facilities may be authorized by the test requester to procure the appropriate material(s).

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
burn length
length of specimen that has been consumed by combustion

NOTE The burn length is determined by subtracting the post-test specimen length from the pre-test specimen length.

3.2
flammable material
a material is considered to be flammable at a specific pressure if at least one specimen burns more than 150 mm at that pressure

3.3
good laboratory practice
GLP
practice which involves the testing of standard reference materials to verify data accuracy and repeatability

4 Principle

In a high-pressure test chamber containing a specific test environment, an ignition source, delivering a defined amount of energy, is applied to the lower end of a vertically oriented test specimen. The maximum post-test burn length for at least 10 standard-sized specimens is recorded. Materials are considered flammable at a specific pressure if at least one specimen burns more than 150 mm. Tests shall be conducted at ambient temperature, in gaseous oxygen or oxygen-enriched environments. The test pressure shall simulate the worst-case environment in which ignition and combustion of the material are likely to occur. To obtain