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Space systems — Safety and compatibility of materials —

Part 1: Determination of upward flammability of materials

Systèmes spatiaux — Sécurité et compatibilité des matériaux —

Partie 1: Détermination de l'inflammabilité verticale des matériaux

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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 document 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*.

This second edition cancels and replaces the first edition (ISO 14624-1:2003), which has been technically revised.

The main changes are as follows:

— updated 6.5 "Bare nickel-chromium wire 0,81 mm (0,5 mm^2 diameter)";

— updated annexes;

— updated the Bibliography.

A list of all parts in the ISO 14624 series can be found on the ISO website.

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.

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Introduction

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

Recommended criteria are, while not mandatory, 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.

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Space systems — Safety and compatibility of materials —

Part 1: Determination of upward flammability of materials

1 Scope

This document specifies a method for the determination of the flammability of aerospace materials by upward flame propagation. This test determines if a material, when exposed to a standard ignition source, will self-extinguish and not transfer burning debris which can ignite adjacent materials.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
ambient conditions
test environment with an oxygen concentration of 20,9 % ± 0,2 %, a pressure of 101,4 kPa ± 5 kPa, and a temperature of 23 °C ± 5 °C

3.2
burn length
distance from the bottom of the specimen to the farthest evidence of flame consumption damage or flame attachment point to the test specimen due to flame as determined by visual observation, visual/physical post-test examination, video of burn, and/or other means

Note 1 to entry: See Table 1 and Figure 1. The burn length distance includes areas of partial or complete combustion, charring or embrittlement, but does not include heat affected areas which can have been damaged only by the heat of the flames emanating from sample consumption below. Heat affected areas appear as sooted, stained, warped or discoloured, or areas where the material has shrunk or melted away from the heat. In some cases, the flame can propagate beyond the farthest visual evidence of damage to the test specimen. Typical material burn model depicted in Figure 1, some materials can show multiple flame fronts and/or other variations.

Table 1 — Burn length assessment characteristics and techniques summary

Burn length / Flame consumption damage	Heat affected damage area	Burn length determination techniques
Complete combustion	Sooted	Visual observation
Partial combustion	Stained	Visual post-test examination
Charring	Warped	Physical post-test examination
Embrittlement	Melted away from heat	Video of burn
Furthest flame attachment point	Shrunk away from heat	Other means

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