INTERNATIONAL STANDARD

ISO 14624-3

Second edition
2023-10

Space systems — Safety and compatibility of materials —

Part 3: Determination of off-gassed compounds from materials and assembled articles

Systèmes spatiaux — Sécurité et compatibilité des matériaux —

Partie 3: Détermination des composés issus du dégazage sous atmosphère des matériaux et des articles assemblés

Reference number
ISO 14624-3:2023(E)

© ISO 2023



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2023 – All rights reserved

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **3**
5 Health and safety of test operators **3**
6 Test conditions **3**
7 Apparatus and materials **4**
8 Test samples **5**
8.1 Handling/receipt 5
8.2 Preparation 5
8.3 Cleaning 6
8.4 Inspection 6
9 Pretest procedure **6**
10 Test procedure **6**
11 Precision **7**
12 Test report **7**
13 Good laboratory practices (GLP) **8**
Annex A (informative) **Materials and assembled articles toxic hazard index and maximum limit mass/article example calculations** **10**
Annex B (normative) **Determination of off-gassed compounds from high temperature sensitive materials and assembled articles at 40 °C** **13**
Bibliography **14**

© ISO 2023 – All rights reserved

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 14624-3:2005), which has been technically revised.

The main changes are as follows:

— updated the definitions;

— updated Clauses 10 and 12 as well as Table 2.

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.

© ISO 2023 – All rights reserved

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.

© ISO 2023 – All rights reserved

Space systems — Safety and compatibility of materials —

Part 3: Determination of off-gassed compounds from materials and assembled articles

1 Scope

This document specifies a method for determining the identity and quantity of volatile off-gassed compounds from materials and assembled articles utilized in manned, pressurized spacecraft.

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
assembled article
combination of materials and/or subcomponents resulting in a complete assembly

3.2
average percent relative standard deviation
quotient of the standard deviations for each off-gassed constituent of *y* replicate samples of a standard material and the total number of off-gassed constituents

Note 1 to entry: For actual samples, the expected test results and average relative standard deviations for the quantities of *off-gassed compounds* (3.6) can be near 50 %. The calculations for standard deviation and average percent relative standard deviation are as follows:

The standard deviation, *s*, is given by:

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

where $\bar{x}$ is the mean for an individual off-gassed constituent.

Therefore, the calculation for the average percent relative standard deviation A_s, is given by:

$$A_s = \frac{\sum s}{y} \times 100\ \%$$

where

© ISO 2023 – All rights reserved