BSI Standards Publication

Gas cylinders — Compatibility of cylinder and valve materials with gas contents

Part 2: Non-metallic materials

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National foreword

This British Standard is the UK implementation of EN ISO 11114-2:2021. It is identical to ISO 11114-2:2021. It supersedes BS EN ISO 11114-2:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PVE/3, Gas containers.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 2: Non-metallic materials (ISO 11114-2:2021)

Bouteilles à gaz - Compatibilité des matériaux des bouteilles et des robinets avec les contenus gazeux - Partie 2: Matériaux non métalliques (ISO 11114-2:2021)

Gasflaschen - Verträglichkeit von Werkstoffen für Gasflaschen und Ventile mit den in Berührung kommenden Gasen - Teil 2: Nichtmetallische Werkstoffe (ISO 11114-2:2021)

This European Standard was approved by CEN on 24 October 2021.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN ISO 11114-2:2021) has been prepared by Technical Committee ISO/TC 58 "Gas cylinders" in collaboration with Technical Committee CEN/TC 23 “Transportable gas cylinders” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 11114-2:2013.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 11114-2:2021 has been approved by CEN as EN ISO 11114-2:2021 without any modification.

Third edition
2021-10

Gas cylinders — Compatibility of cylinder and valve materials with gas contents —

Part 2: Non-metallic materials

Bouteilles à gaz — Compatibilité des matériaux des bouteilles et des robinets avec les contenus gazeux —

Partie 2: Matériaux non métalliques

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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 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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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 58, *Gas cylinders*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 23, *Transportable gas cylinders,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 11114-2:2013), which has been technically revised. The main changes compared with the previous edition are as follows:

— new materials were added in Table 1;

— Table 2, dedicated to the compatibility for liners, was added.

A list of all parts in the ISO 11114 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.

Introduction

This document provides guidance on the compatibility of non-metallic materials used for gas cylinders and gas cylinder valves with the gas contents of the cylinder. Compatibility of metallic materials is covered in ISO 11114-1.

Non-metallic materials are very often used for the construction of gas cylinder valves as seals, e.g. O-ring, gland packing, seats or as lubrication products to avoid friction. They are also commonly used to ensure sealing of the valve/cylinder connection. For gas cylinders, they are sometimes used as an internal coating or as a liner for composite materials.

Non-metallic materials not in contact with the gas are not covered by this document.

This document is based on current international experience and knowledge. Some data are derived from experience involving a mixture of the gas concerned with a dilutant, where no data for single component gases were available.

This document has been written so that it is suitable to be referenced in the UN Model Regulations[7].

Gas cylinders — Compatibility of cylinder and valve materials with gas contents —

Part 2: Non-metallic materials

1 Scope

This document gives guidance on the selection and evaluation of compatibility between non-metallic materials for gas cylinders and valves and the gas contents. It is also applicable to tubes, pressure drums and bundles of cylinders.

This document covers composite and laminated materials used for gas cylinders. It does not include ceramics, glasses and adhesives.

This document considers the influence of the gas in changing the material and mechanical properties (e.g. chemical reaction or change in physical state). The basic properties of the materials, such as mechanical properties required for design purposes (normally available from the materials supplier), are not considered. Other aspects, such as quality of delivered gas, are not considered.

The compatibility data given are related to single component gases but can be applicable to gas mixtures.

This document does not apply to cryogenic fluids (this is covered in ISO 21010).

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 10286, *Gas cylinders — Vocabulary*

ISO 10297, *Gas cylinders — Cylinder valves — Specification and type testing*

ISO 11114-3, *Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 3: Autogenous ignition test for non-metallic materials in oxygen atmosphere*

ISO 15001, *Anaesthetic and respiratory equipment — Compatibility with oxygen*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10286 and the following apply.

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

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

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