
**Transportable gas cylinders —
Compatibility of cylinder and valve
materials with gas contents —**

**Part 2:
Non-metallic materials**

*Bouteilles à gaz transportables — 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 11114 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 1114 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 58, *Gas cylinders*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

ISO 11114 consists of the following parts, under the general title *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents*:

- *Part 1: Metallic materials*
- *Part 2: Non-metallic materials*
- *Part 3: Autogenous ignition test in oxygen atmosphere*
- *Part 4: Test method for hydrogen compatibility with metals*

Annex A to this part of ISO 11114 is for information only.

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Foreword

EN ISO 11114-2:2000 has been prepared by Technical Committee CEN/TC 23 "Transportable gas cylinders", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 58 "Gas cylinders".

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 xx-xx-xx, and conflicting national standards shall be withdrawn at the latest by June 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standards: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard has been submitted for reference into the RID and/or in the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

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Introduction

This Standard is one part of a three-part standard concerning compatibility of gases and gas mixtures with materials :

- *Part 1 : Metallic materials ;*
- *Part 2 : Non-metallic materials ;*
- *Part 3 : Autogenous ignition test in oxygen atmosphere.*

This standard deals with 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 treated in EN 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 standard.

Previously, no recognised compilation has existed for non-metallic cylinder/valve material compatibility with gas contents. This standard therefore presents the current state of the knowledge on the subject.

This standard is based on current international experience and knowledge. It does not cover the subject completely and is intended to give guidance only in evaluating the compatibility of gas/material combinations. 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.

1 Scope

This Standard gives guidance in the selection and evaluation of compatibility between non-metallic materials for gas cylinders and valves and the cylinders' gas contents. This standard also covers bundles, tubes and pressure drums.

This standard may be helpful for composite and laminated materials.

Only the influence of the gas in changing the material and mechanical properties is considered (for example chemical reaction or change in physical state). The basic mechanical properties of the materials required for design purposes are normally available from the materials supplier and are not considered in this standard.

The compatibility data given are related to single component gases but can be used to some extent for gas mixtures. Ceramics, glasses, and adhesives are not covered by this standard.

Aspects such as quality of delivered gas are not considered.

2 Normative references

This Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 849:1996,	<i>Transportable gas cylinders - Cylinder valves - Specification and type testing</i>
EN 1797-1,	<i>Cryogenic vessels - Gas/material compatibility - Part 1 : Oxygen compatibility</i>
EN ISO 11114-1,	<i>Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 1 : Metallic materials (ISO 11114-1:1997)</i>
ISO 10297,	<i>Gas cylinders - Refillable gas cylinder valves - Specification and type testing</i>

3 Terms and definitions

For the purposes of this Standard the following terms and definitions apply.

3.1 competent person

a person who has the necessary technical knowledge, experience and authority to assess and approve materials for use with gases and to define any special conditions of use that are necessary. Such a person will also normally be formally qualified in an appropriate technical discipline