
**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.

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 11114-2 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, in collaboration with Technical Committee CEN/TC 23, *Transportable Gas cylinders* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition, Clauses 4 and 6, and Table 1 of which have been technically revised. Annex A has been deleted.

ISO 11114 consists of the following parts, under the general title *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 for non-metallic materials in oxygen atmosphere;*
- *Part 4: Test methods for selecting metallic materials resistant to hydrogen embrittlement.*

Introduction

This part of ISO 11114 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 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 part of ISO 11114.

This part of ISO 11114 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 part of ISO 11114 has been written to be in conformity with the UN Recommendations on the Transport of Dangerous Goods: Model Regulations. When published it will be submitted to the UN Sub Committee of Experts on the Transport of Dangerous Goods with a request that it be included in the Model Regulations. Where there is any conflict between this part of ISO 11114 and any applicable regulation, the regulation always takes precedence.

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

Part 2: Non-metallic materials

1 Scope

This part of ISO 11114 gives guidance in the selection and evaluation of compatibility between non-metallic materials for gas cylinders and valves and the gas contents. It also covers bundles, tubes and pressure drums.

This part of ISO 11114 can be helpful for composite and laminated materials used for gas cylinders.

It does not cover the subject completely and is intended to give guidance only in evaluating the compatibility of gas/material combinations.

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 properties of the materials, such as mechanical properties, required for design purposes are normally available from the materials supplier and are not considered in this part of ISO 11114.

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 part of ISO 11114.

Other aspects such as quality of delivered gas are not considered.

This part of ISO 11114 is not intended to be used for cryogenic fluids (see ISO 21010).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 10297, *Gas cylinders — Refillable gas cylinder valves — Specification and type testing*

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

3 Terms and definitions

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