SLOVENSKI STANDARD
oSIST prEN ISO 11114-6:2021

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Plinske jeklenke - Združljivost materialov za ventil in jeklenko s plinom - 6. del: Preskus prenapetosti tlaka kisika (ISO/DIS 11114-6:2021)

Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 6: Oxygen pressure surge testing (ISO/DIS 11114-6:2021)

Gasflaschen - Verträglichkeit von Flaschen- und Ventilwerkstoffen mit den in Berührung kommenden Gasen - Teil 6: Sauerstoff-Druckstossprüfung (ISO/DIS 11114-6:2021)

Bouteilles à gaz - Compatibilité des matériaux des bouteilles et des robinets avec les contenus gazeux - Partie 6: Essai de compression adiabatique à l'oxygène (ISO/DIS 11114-6:2021)

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Part 6:
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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

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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.

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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 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).

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

Oxygen pressure surge testing has been required by a number of different product standards covering:

— valves used for gas cylinders, tubes, pressure drums and cylinder bundles,

— Residual Pressure Valves (RPVs),

— self-closing valves,

— industrial and medical Valves with Integrated Pressure Regulators (VIPRs),

— pressure regulators,

— hoses.

Oxygen pressure surge testing is also described in other testing standards such as ISO 21010, ASTM G175 and ASTM G74.

Note A list of standards is in the bibliography.

Requirements for the test facility and test procedures differ from standard to standard due to modifications introduced over the years and lack of coordination. This may result in a need to modify the testing procedures and equipment depending on the product (e.g. valves, hoses, pressure regulators) knowing that the aim of the test remains the same.

This document aims to standardize the test equipment and the test procedure so that in future, product standards can refer to this document and only give additional requirements e.g. test pressure, number of test samples needed to be submitted for the test.

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

Part 6: Oxygen pressure surge testing

1 Scope

This document specifies requirements for the test apparatus and test procedure in order to apply oxygen pressure surges consistently to devices being tested for resistance to adiabatic compression and to materials for oxygen compatibility.

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 — Terminology*

3 Terms and definitions

For the purposes of this document, the definitions given in ISO 10286 and the following terms and definitions 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 https://www.electropedia.org/

3.1
surge tube
<cannon>
metallic tube of defined internal diameter and length installed between the outlet plane of the quick-opening valve or the calibrated orifice (if applicable) and the intermediate connector to ensure a reproducible severity of the test condition

Note 1 to entry: In some documents, the term connecting tube is used for this purpose.

3.2
test pressure
static pressure upstream the quick-opening valve in closed conditions

Note 1 to entry: The test pressure is expressed in bar.

Note 2 to entry: The test pressure is given in the product standard (see Bibliography).

3.3
pressure rise time
time required for the pressure to rise as calculated in 5.5

3.4
product standard
standard that specifies requirements to be fulfilled by materials and/or accessories to establish their fitness for purpose

[SOURCE: ISO/IEC Guide 2:2004, definition 5.4, modified]

Note 1 to entry: See examples of product standards in Bibliography.

4 Test installation

4.1 Test gas

4.1.1 Test gas specification

The oxygen pressure surge test shall be carried out with oxygen.

Gas specification shall correspond to Table 1.

Table 1 — Gas specification

Parameter	Requirement
Minimum purity	≥ 99,5 % by volume
Hydrocarbon content	≤ 0,01 % by volume
Maximum particle size	See 5.1
NOTE Most industrial oxygen grades meet the above specifications	

4.1.2 Temperature of test gas

The oxygen used for calibration and testing shall be at a temperature of 60 °C (±3 °C) unless otherwise specified by the appropriate product standard.

4.2 Condition of test sample

In general, for accessories, test samples are initially (before test) at room temperature[1)].

Some standards require the test sample to be heated (e.g. (60 ± 3) °C).

4.3 Surge tube

The surge tube shall be suitable for oxygen (see note below) and rated for the maximum pressure and temperature which the material of the surge tube reaches during the test.

NOTE Surge tubes are usually made of Monel or with Monel liner materials. Other oxygen compatible materials are acceptable.

The surge tube should be nominally straight. A bend is sometimes used to retain test samples (such as oils), if necessary.

The product standards listed in the Bibliography require the use of different geometries for the surge tube:

— Type A: Nominal length of 1 m and an internal nominal diameter of 5 mm (or nominal fractional inch equivalent),

1) Typically between 15 °C and 30 °C.