

Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 1: Metallic materials (ISO 11114-1:2012)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 11114-1:2012 sisaldab Euroopa standardi EN ISO 11114-1:2012 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 11114-1:2012 consists of the English text of the European standard EN ISO 11114-1:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 15.03.2012.	Date of Availability of the European standard is 15.03.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 23.020.30

Võtmesõnad: compatibility, estimation, gas cylinders, gas pressure vessels, gas valves, gases, metal products, rules, selection,

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Aru 10, 10317 Tallinn, Eesti; www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:
Aru 10, 10317 Tallinn, Estonia; www.evs.ee; phone 605 5050; e-mail info@evs.ee

English Version

Gas cylinders - Compatibility of cylinder and valve materials with
gas contents - Part 1: Metallic materials (ISO 11114-1:2012)

Bouteilles à gaz - Compatibilité des matériaux des
bouteilles et des robinets avec les contenus gazeux - Partie
1: Matériaux métalliques (ISO 11114-1:2012)

Gasflaschen - Verträglichkeit von Werkstoffen für
Gasflaschen und Ventile mit den in Berührung kommenden
Gasen - Teil 1: Metallische Werkstoffe (ISO 11114-1:2012)

This European Standard was approved by CEN on 18 February 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

This document (EN ISO 11114-1:2012) 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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

This document supersedes EN ISO 11114-1:1997.

This European Standard has been submitted for reference into the RID and/or the technical annexes of the ADR.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 11114-1:2012 has been approved by CEN as a EN ISO 11114-1:2012 without any modification.

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Materials	2
4.1 General	2
4.2 Cylinder materials	3
4.3 Valve materials	3
5 Compatibility criteria	3
5.1 General	3
5.2 Corrosion	4
5.3 Hydrogen embrittlement phenomenon	5
5.4 Generation of dangerous products	5
5.5 Violent reactions (e.g. ignition).....	5
5.6 Stress corrosion cracking	5
6 Material compatibility.....	5
6.1 Table of compatibility for single gases (see Table 1).....	5
6.2 Compatibility for gas mixtures.....	5
6.3 Using Table 1	6
Annex A (informative) Gas/materials NQSAB compatibility code	33
Bibliography.....	47

Introduction

Industrial, medical and special gases (e.g. high-purity gases, calibration gases) can be transported or stored in gas cylinders. An essential requirement of the material from which such gas cylinders and their valves are manufactured is compatibility with the gas content.

Compatibility of cylinder materials with gas content has been established over many years by practical application and experience. Existing national and international regulations and standards do not fully cover this aspect.

This part of ISO 11114 is based on current international experience and knowledge.

Where there is any conflict between this International Standard and any applicable regulation, the regulation always takes precedence.

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.

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

Part 1: Metallic materials

1 Scope

This part of ISO 11114 provides requirements for the selection of safe combinations of metallic cylinder and valve materials and cylinder gas content.

The compatibility data given is related to single gases and to gas mixtures.

Seamless metallic, welded metallic and composite gas cylinders and their valves, used to contain compressed, liquefied and dissolved gases, are considered.

NOTE In this part of ISO 11114 the term “cylinder” refers to transportable pressure receptacles, which also include tubes and pressure drums.

Aspects such as the quality of delivered gas product are not considered.

2 Normative references

The following referenced documents are indispensable for the application 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 9809-1, *Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa*

ISO 10156, *Gases and gas mixtures — Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets*

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

ISO 11114-2, *Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials*

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 11120, *Gas cylinders — Refillable seamless steel tubes for compressed gas transport of water capacity between 150 l and 3 000 l — Design, construction and testing*