

SLOVENSKI STANDARD

SIST EN ISO 11120:2015

01-maj-2015

Nadomešča:

SIST EN ISO 11120:2000

SIST EN ISO 11120:2000/A1:2013

Plinske jeklenke - Ponovno polnljive velike jeklenke iz celega iz jekla z vodno prostornino od 150 do 3000 l - Konstruiranje, izdelava in preskušanje (ISO 11120:2015)

Gas cylinders - Refillable seamless steel tubes of water capacity between 150 l and 3000 l - Design, construction and testing (ISO 11120:2015)

Gasflaschen - Wiederbefüllbare nahtlose Großflaschen aus Stahl mit einem Fassungsraum zwischen 150 l und 3 000 l - Ausführung, Bau und Prüfung (ISO 11120:2015)

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>

Bouteilles à gaz - Tubes en acier sans soudure rechargeables d'une contenance en eau de 150 l à 3000 l - Conception, construction et essais (ISO 11120:2015)

Ta slovenski standard je istoveten z: EN ISO 11120:2015

ICS:

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
-----------	---------------------------------	---------------------------------

SIST EN ISO 11120:2015

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 11120:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>

EUROPEAN STANDARD

EN ISO 11120

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2015

ICS 23.020.30

Supersedes EN ISO 11120:1999

English Version

Gas cylinders - Refillable seamless steel tubes of water capacity between 150 l and 3000 l - Design, construction and testing (ISO 11120:2015)

Bouteilles à gaz - Tubes en acier sans soudure rechargeables d'une contenance en eau de 150 l à 3000 l - Conception, construction et essais (ISO 11120:2015)

Gasflaschen - Wiederbefüllbare nahtlose Großflaschen aus Stahl mit einem Fassungsraum zwischen 150 l und 3 000 l - Auslegung, Bau und Prüfung (ISO 11120:2015)

This European Standard was approved by CEN on 4 October 2014.

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, Former Yugoslav Republic of Macedonia, 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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....3

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 11120:2015](https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015)

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>

Foreword

This document (EN ISO 11120:2015) 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 August 2015, and conflicting national standards shall be withdrawn at the latest by August 2015.

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 11120:1999.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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, Former Yugoslav Republic of Macedonia, 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.

SIST EN ISO 11120:2015

Endorsement notice

[https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-](https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015)

[01444d7d13c8/sist-en-iso-11120-2015](https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015)

The text of ISO 11120:2015 has been approved by CEN as EN ISO 11120:2015 without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 11120:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>

INTERNATIONAL
STANDARD

ISO
11120

Second edition
2015-02-01

**Gas cylinders — Refillable seamless
steel tubes of water capacity
between 150 l and 3000 l — Design,
construction and testing**

*Bouteilles à gaz — Tubes en acier sans soudure rechargeables d'une
contenance en eau de 150 l à 3000 l — Conception, construction et essais*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 11120:2015](https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015)

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>



Reference number
ISO 11120:2015(E)

© ISO 2015

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 11120:2015

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	2
5 Inspection and testing	3
6 Materials	3
6.1 General requirements.....	3
6.2 Controls on chemical composition.....	4
6.3 Heat treatment.....	5
6.4 Mechanical properties.....	5
6.5 Failure to meet test requirements.....	5
7 Design	6
7.1 Calculation of cylindrical shell thickness.....	6
7.2 Design of tube ends.....	6
7.3 Design drawing.....	7
8 Construction and workmanship	7
8.1 General.....	7
8.2 Surface imperfections.....	7
8.3 Ultrasonic examination.....	7
8.4 End closure (fitting).....	7
8.5 Dimensional tolerances.....	7
8.5.1 Out-of-roundness.....	7
8.5.2 Outside diameter.....	7
8.5.3 Straightness.....	8
8.5.4 Eccentricity.....	8
8.5.5 Length.....	8
8.5.6 Water capacity.....	8
8.5.7 Mass.....	8
9 Type approval procedure	9
9.1 General requirements.....	9
9.2 Prototype tests.....	9
9.3 Type approval test report.....	10
9.4 Type approval certificate.....	10
10 Batch tests	10
10.1 General requirements.....	10
10.2 Mechanical tests.....	10
10.2.1 General requirements.....	10
10.2.2 Tensile test.....	11
10.2.3 Impact testing.....	11
10.3 Interpretation of results.....	11
11 Tests on every tube	11
11.1 General.....	11
11.2 Hydraulic test.....	12
11.2.1 Proof pressure test.....	12
11.2.2 Volumetric expansion test.....	12
11.3 Hardness testing.....	12
11.4 Visual inspection.....	13

ISO 11120:2015(E)

11.5	Dimensional inspection.....	13
11.5.1	Thickness.....	13
11.5.2	Diameter and length.....	13
11.5.3	Water capacity and mass.....	13
11.5.4	Neck threads and openings.....	13
11.6	Ultrasonic non-destructive test.....	13
12	Special requirements for tubes for embrittling gases.....	14
12.1	General.....	14
12.2	Materials.....	14
12.3	Design.....	14
12.4	Construction and workmanship.....	14
12.4.1	General.....	14
12.4.2	Surface imperfections.....	14
12.5	Mechanical tests.....	15
12.5.1	Tensile and impact tests.....	15
12.5.2	Hardness test.....	15
13	Inspection certificate.....	15
14	Marking.....	16
Annex A	(informative) Typical chemistry groupings for seamless steel tubes.....	17
Annex B	(normative) Ultrasonic examination.....	18
Annex C	(informative) Description and evaluation of manufacturing imperfections and conditions for rejection of seamless steel tubes at time of final inspection by the manufacturer.....	23
Annex D	(informative) Acceptance certificate.....	29
Annex E	(informative) Type approval certificate.....	31
Annex F	(informative) Bend stress calculation.....	32
Bibliography	33

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 58, *Gas cylinders*, Subcommittee SC 3, *Cylinder design*.

This second edition cancels and replaces the first edition (ISO 11120:1999), which has been technically revised by the following:

- [Annex A](#) “Typical chemistry groupings for seamless steel tubes” is informative;
- nickel chromium molybdenum steel has been added in [6.1.1](#) and [Annex A](#) as Group V;
- reduction of maximum sulfur content in [6.2.2](#) from 0,020 % to 0,010 %; also the sum of sulfur and phosphorus is reduced from 0,030 % to 0,025 %;
- the modification of ultrasonic provisions for ultrasonic examination in [8.3](#) to include ultrasonic examination for wall thickness and for imperfections also on the supplied tubing;
- “Type Approval Procedure” has been introduced in [Clause 9](#);
- the provisions for design of tubes for embrittling gases have been revised.

It also incorporates ISO 11120:1999/Amd 1:2013.

ISO 11120:2015(E)

Introduction

This International Standard provides a specification for the design, manufacture, inspection and testing of tubes at the time of manufacture for worldwide usage. The objective is to balance design and economic efficiency against international acceptance and universal utility.

This International Standard aims to eliminate concern about climate, duplicate inspections and restrictions currently existing because of lack of definitive International Standards. It does not reflect on the suitability of the practice of any nation or region.

This International Standard addresses the general requirements on design, construction and initial inspection and testing of pressure receptacles of the United Nations *Recommendations on the Transport of Dangerous Goods: Model Regulations*.

It is intended to be used under a variety of regulatory regimes, but it is suitable for use with the conformity assessment system for UN pressure receptacles of the above-mentioned Model Regulations.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 11120:2015

<https://standards.iteh.ai/catalog/standards/sist/df5e280b-c962-4889-a2fe-01444d7d13c8/sist-en-iso-11120-2015>

Gas cylinders — Refillable seamless steel tubes of water capacity between 150 l and 3000 l — Design, construction and testing

1 Scope

This International Standard specifies minimum requirements for the material, design, construction and workmanship, manufacturing processes, examinations and tests at manufacture of refillable quenched and tempered seamless steel tubes of water capacities exceeding 150 l up to and including 3 000 l for compressed and liquefied gases exposed to extreme world-wide ambient temperatures, normally between $-50\text{ }^{\circ}\text{C}$ and $+65\text{ }^{\circ}\text{C}$.

This International Standard is applicable to tubes with a maximum tensile strength, $R_{m\alpha}$, of less than 1 100 MPa. These tubes can be used alone or in batteries to equip trailers or multiple element gas containers (ISO modules or skids) for the transportation and distribution of compressed gases.

This International Standard is applicable to tubes having an opening at each end.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 148-2, *Metallic materials — Charpy pendulum impact test — Part 2: Verification of testing machines*

ISO 148-3, *Metallic materials — Charpy pendulum impact test — Part 3: Preparation and characterization of Charpy V-notch test pieces for indirect verification of pendulum impact machines*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6506-2, *Metallic materials — Brinell hardness test — Part 2: Verification and calibration of testing machines*

ISO 6506-3, *Metallic materials — Brinell hardness test — Part 3: Calibration of reference blocks*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 11114-1, *Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials*

ISO 11114-4, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 4: Test methods for selecting metallic materials resistant to hydrogen embrittlement*

ISO 13769, *Gas cylinders — Stamp marking*

3 Terms and definitions

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