

SVENSK STANDARD

SS-EN ISO 11120:2015



Fastställt/Approved: 2015-02-10
Publicerad/Published: 2015-02-11
Utgåva/Edition: 2
Språk/Language: engelska/English
ICS: 23.020.30

Gasflaskor – Återfyllningsbara sömlösa storflaskor av stål med vattenkapacitet mellan 150 l och 3000 l – Konstruktion, tillverkning och provning (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)



Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

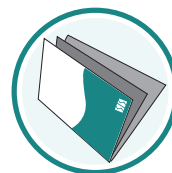
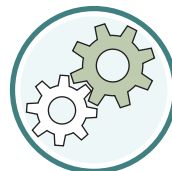
Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

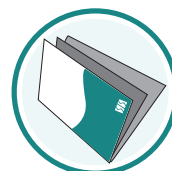
Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Europastandarden EN ISO 11120:2015 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 11120:2015.

Denna standard ersätter SS-EN ISO 11120, utgåva 1 och SS-EN ISO 11120/A1:2013, utgåva 1.

The European Standard EN ISO 11120:2015 has the status of a Swedish Standard. This document contains the official version of EN ISO 11120:2015.

This standard supersedes the Swedish Standard SS-EN ISO 11120, edition 1 and SS-EN ISO 11120/A1:2013, edition 1.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Gasflaskor, SIS/TK 296.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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	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

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

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.

Endorsement notice

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

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.

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 °C and $+65\text{ °C}$.

This International Standard is applicable to tubes with a maximum tensile strength, R_{ma} , 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.