



SLOVENSKI STANDARD SIST EN ISO 11439:2013

01-december-2013

Nadomešča:
SIST EN ISO 11439:2002

Plinske jeklenke - Visokotlačne jeklenke za zemeljski plin za pogon motornih vozil, vgrajene na vozilo (ISO 11439:2013)

Gas cylinders - High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles (ISO 11439:2013)

Gasflaschen - Hochdruck-Flaschen für die fahrzeuginterne Speicherung von Erdgas als Treibstoff für Kraftfahrzeuge (ISO 11439:2013)

Bouteilles à gaz - Bouteilles haute pression pour le stockage de gaz naturel utilisé comme carburant à bord des véhicules automobiles (ISO 11439:2013)

Ta slovenski standard je istoveten z: EN ISO 11439:2013

ICS:

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
43.060.40	Sistemi za gorivo	Fuel systems

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EUROPEAN STANDARD

EN ISO 11439

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2013

ICS 23.020.30; 43.060.40

Supersedes EN ISO 11439:2000

English Version

Gas cylinders - High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles (ISO 11439:2013)

Bouteilles à gaz - Bouteilles haute pression pour le
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Gasflaschen - Hochdruck-Flaschen für die fahrzeuginterne
Speicherung von Erdgas als Treibstoff für Kraftfahrzeuge
(ISO 11439:2013)

This European Standard was approved by CEN on 18 April 2013.

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

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Foreword

This document (EN ISO 11439:2013) 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 December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

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 11439:2000.

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.

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The text of ISO 11439:2013 has been approved by CEN as EN ISO 11439:2013 without any modification.

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INTERNATIONAL
STANDARD

ISO
11439

Second edition
2013-06-01

**Gas cylinders — High pressure
cylinders for the on-board storage of
natural gas as a fuel for automotive
vehicles**

*Bouteilles à gaz — Bouteilles haute pression pour le stockage de gaz
naturel utilisé comme carburant à bord des véhicules automobiles*

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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 11439 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 3, *Cylinder design*.

This second edition cancels and replaces the first edition (ISO 11439:2000), which has been technically revised. In addition to editorial improvements, the principal technical difference between the first and second editions is the clarification and alteration of the “Change of Design” requirements for the various cylinder types.

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ISO 11439:2013(E)**Introduction**

Cylinders for the on-board storage of fuel for natural gas vehicle service are required to be light-weight, at the same time maintaining or improving on the level of safety currently existing for other pressure vessels.

Owners or users of cylinders designed to this International Standard should note that the cylinders are designed to operate safely if used in accordance with specified service conditions for a specified finite service life only. The expiry date is marked on each cylinder and it is the responsibility of owners and users to ensure that cylinders are not used after that date, and that they are inspected in accordance with the manufacturer's instructions.

Users of this International Standard are encouraged to consider the environmental impacts associated with performing certain tests.

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Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles

1 Scope

This International Standard specifies minimum requirements for light-weight refillable gas cylinders intended only for the on-board storage of high pressure compressed natural gas as a fuel for automotive vehicles to which the cylinders are to be fixed. The service conditions do not cover external loadings that can arise from vehicle collisions, etc.

This International Standard covers cylinders of any seamless steel, seamless aluminium alloy or non-metallic material construction, using any design or method of manufacture suitable for the specified service conditions. This International Standard does not cover cylinders of stainless steel. Although this standard uses 200 bar as a reference working pressure, other working pressures can be used.

Cylinders covered by this International Standard are designated Type 1, Type 2, Type 3 and Type 4.

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 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 2808, *Paints and varnishes — Determination of film thickness*

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

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

ISO 7866, *Gas cylinders — Refillable seamless aluminium alloy gas cylinders — Design, construction and testing*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

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

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 9809-2, *Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1 100 MPa*

ISO 9809-3, *Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders*

ISO 14130, *Fibre-reinforced plastic composites — Determination of apparent interlaminar shear strength by short-beam method*

ISO 15403-1, *Natural gas — Natural gas for use as a compressed fuel for vehicles — Part 1: Designation of the quality*

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ISO/TR 15403-2, *Natural gas — Natural gas for use as a compressed fuel for vehicles — Part 2: Specification of the quality*

ISO 15500-13, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 13: Pressure relief device (PRD)*

ASTM D522-93a, *Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings*

ASTM D1308-87, *Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes*

ASTM D2794-93, *Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)*

ASTM D3170-87, *Standard Test Method for Chipping Resistance of Coatings*

ASTM D3359, *Standard Test Methods for Measuring Adhesion by Tape Test*

ASTM D3418, *Standard Test Method for Transition Temperatures of Polymers by Differential Scanning Calorimetry*

ASTM G154:2006¹⁾, *Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials*

NACE/TM 0177-96, *Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H₂S Environments*

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3 Terms and definitions (standards.iteh.ai)

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

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3.1 <https://standards.iteh.ai/catalog/standards/sist/6b99769a-80aa-47ca-a923-545c7a45d80e/sist-en-iso-11439-2013>
authorized inspection body

authorized inspection body, approved or recognized by the regulatory authority of the user country, for the supervision of construction and testing of cylinders used for the on-board storage of natural gas

3.2
autofrettage

pressure application procedure used in manufacturing composite cylinders with metal liners, which strains the liner past its yield point sufficient to cause permanent plastic deformation

3.3
autofrettage pressure

pressure within the overwrapped cylinder at which the required distribution of stresses between the liner and the overwrap is established

3.4
batch – composite cylinders

group of not more than 200 cylinders plus cylinders for destructive testing, or if greater, one shift of successive production of cylinders, successively produced from qualified liners having the same size, design, specified materials of construction and process of manufacture

3.5
batch – metal cylinders/liners

group of not more than 200 cylinders/liners plus cylinders/liners for destructive testing, or if greater, one shift of successive production of metal cylinders/liners, successively produced having the same nominal diameter, wall thickness, design, specified material of construction, material cast, process of manufacture, equipment for manufacture and heat treatment, and conditions of time, temperature and atmosphere during heat treatment

1) Most recent version is ASTM G154-12a, 2012.

3.6**batch – non-metallic liners**

group of not more than 200 liners plus liners for destructive testing, or if greater, one shift of successive production of non-metallic liners, successively produced having the same nominal diameter, wall thickness, design, specified material of construction and process of manufacture

3.7**burst pressure**

highest pressure reached in a cylinder during a burst test

3.8**composite cylinder**

cylinder made of resin-impregnated continuous filament wound over a metallic or non-metallic liner

3.9**destroyed**

cylinder in a state of alteration which makes it physically unusable for its purpose

3.10**finished cylinders**

completed cylinders which are ready for use, complete with identification marks and external coating including integral insulation and/or protection as specified by the manufacturer on the design drawing for the cylinder

3.11**liner**

inner portion of the composite cylinder, comprising of a metallic or non-metallic vessel

3.12**manufacturer**

person or organization responsible for the design, fabrication and testing of the cylinders

3.13**overwrap**

reinforcement system of filament and resin applied over the liner

3.14**pre-stress**

process of applying autofrettage or controlled tension winding

3.15**service life**

life, in years, during which the cylinders can be used in accordance with the standard service conditions

3.16**settled pressure**

gas pressure when a given settled temperature is reached

3.17**settled temperature**

uniform gas temperature in the cylinder after the dissipation of any heat caused by filling

3.18**test pressure**

required pressure applied during a pressure test

3.19**type 1 design**

an all metal cylinder