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**Gasflaskor – Svetsade behållare av stål med kapacitet till och med 3000 l – Konstruktion och tillverkning –
Del 1: Tryckfat med volym till och med 1000 l (ISO 21172-1:2015, IDT)**

**Gas cylinders – Welded steel pressure drums up to 3 000 litres capacity for the transport of gases – Design and construction –
Part 1: Capacities up to 1 000 litres (ISO 21172-1:2015, IDT)**



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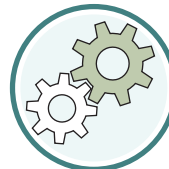
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The International Standard ISO 21172-1:2015 has the status of a Swedish Standard. This document contains the official English version of ISO 21172-1:2015.

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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.

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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.

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*.

ISO 21172 consists of the following parts, under the general title *Gas cylinders — Welded steel pressure drums up to 3000 l capacity for the transport of gases — Design and construction*:

— *Part 1: Capacities up to 1 000 litres*

Capacities up to 3 000 litres will form the subjects of future Part 2.

Introduction

The purpose of this part of ISO 21172 is to provide a specification for the design, manufacture, inspection, and approval of welded steel gas pressure drums.

The specifications given are based on knowledge of and experience with, materials, design requirements, manufacturing processes, and control during manufacture of steel drums in common use in the countries of the participating members. Pressure drums is intended to be designed, manufactured, and closed so that during normal conditions of transport including the effects of handling, temperature, vibration, humidity, or pressure, there will be no release of dangerous goods that would endanger public safety.

This part of ISO 21172 is intended to be used under a variety of national and international regulatory regimes. Where there is any conflict between this International Standard and any applicable regulation, the regulation always takes precedence.

This part of ISO 21172 has been written so that it is suitable to be referenced in the UN Model Regulations.

Gas cylinders — Welded steel pressure drums up to 3 000 litres capacity for the transport of gases — Design and construction —

Part 1: Capacities up to 1 000 litres

1 Scope

This part of ISO 21172 specifies the minimum requirements for the material, design, fabrication, construction and workmanship, inspection, and testing at manufacture of refillable welded steel gas pressure drums, hereafter referred to as drums, of volumes 150 l to 1 000 l and up to 300 bar test pressure for compressed and liquefied gases. Only cylindrical and spherical containers are covered.

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, *Steel — Charpy impact test (V-notch)*

ISO 1106-1, *Recommended practice for radiographic examination of fusion welded joints — Part 1: Fusion welded butt joints in steel plates up to 50 mm thick*

ISO 2063, *Thermal spraying — Metallic and other inorganic coatings — Zinc, aluminium and their alloys*

ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

ISO 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 4978, *Flat rolled steel products for welded gas cylinders*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO 7438, *Metallic materials — Bend test*

ISO 9328-1, *Steel flat products for pressure purposes — Technical delivery conditions — Part 1: General requirements*

ISO 9328-2, *Steel flat products for pressure purposes — Technical delivery conditions — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

ISO 9328-3, *Steel flat products for pressure purposes — Technical delivery conditions — Part 3: Weldable fine grain steels, normalized*

ISO 9328-4, *Steel flat products for pressure purposes — Technical delivery conditions — Part 4: Nickel-alloy steels with specified low temperature properties*

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ISO 9328-5, *Steel flat products for pressure purposes — Technical delivery conditions — Part 5: Weldable fine grain steels, thermomechanically rolled*

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

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

ISO 10920, *Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Specification*

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

ISO 11114-2, *Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-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 11116-1, *Gas cylinders — 17E taper thread for connection of valves to gas cylinders — Part 1: Specifications*

ISO 13769, *Gas cylinders — Stamp marking*

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

ISO 15614-1, *Steel welding procedure qualifications*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO 17638, *Non-destructive testing of welds — Magnetic particle testing*

EN 462-3, *Non-destructive testing — Image quality of radiographs — Image quality classes for ferrous metals*

ASTM A285/ASTM A285M-03 (2007), *Standard specification for pressure vessel plates, carbon steel, low and intermediate tensile strength*

3 Terms and definitions

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

3.1 yield strength
stress value corresponding to the lower yield strength, R_{eL} or, for steels that do not exhibit a defined yield point, the 0,2 % proof strength, $R_{p0,2}$ for carbon steels; and 1 % proof strength for austenitic stainless steels, $R_{p1,0}$

3.2 normalizing
heat treatment given to the steel by heating to a uniform temperature above the upper critical point (AC_3) of the steel and then cooled in a controlled atmosphere or still air

3.3 stress relieving
heat treatment given to reduce the residual stresses of the steel

3.4 batch
quantity of finished drums of a specific type made to the same design, size, and material specifications; using the same welding procedures and heat-treated under the same conditions of temperature and duration

3.5

test pressure

pressure applied to the drum after completion of all fabrication

3.6

finished drum

drum which is fully assembled and appropriately stamp marked, but without any external coatings

3.7

rolling bands

circumferential rings attached to the drum to protect it from external damage

3.8

hot pressure welding (forged)

solid state joining of two metallic parts by the application of heat and pressure

4 Inspection and testing

Evaluation of conformity should be performed in accordance with the regulations recognized by the country(ies) where the drums are intended to be used.

To ensure that the drums conform to the requirements of ISO 21172-1, they shall be subject to inspection and testing in accordance with [Clause 16](#) by an inspection body (hereafter referred to as “the inspector”) authorized by the applicable regulation.

Equipment used for measurement, testing, and examination during production shall be maintained and calibrated within a documented quality management system.

5 Materials

5.1 General provisions

5.1.1 Materials for the pressure envelope

Materials for the pressure envelope shall conform to ISO 4978 or ISO 9328-1 to ISO 9328-4 for carbon steels and ISO 9328-5 for austenitic stainless steels and austeno-ferritics steels.

For drums made using hot pressure welded heads according to [Annex D](#), the materials shall conform to ASTM specification A285/285M, Grade A and have a minimum tensile strength of 310 MPa.

5.1.2 The materials used for the drum

The materials used for the drum, including welded zones, shall be compatible with the intended gas service and meet the applicable requirements of ISO 11114-1, ISO 11114-2, and ISO 11114-4.

Components (e.g. bolts and studs) in contact with the gas shall meet the applicable requirements of ISO 11114-1, ISO 11114-2, and ISO 11114-4.

5.1.3 All parts welded to the drum

All parts welded to the drum shall be made of material that is compatible with respect to weldability and strength (e.g. from ISO 9327).

5.1.4 Welding consumables

The welding consumables shall be such that they are capable of giving consistent welds with the material properties at least equal to that specified for the parent material in the finished drum.