



International
Standard

ISO 9809-4

**Gas cylinders — Design,
construction and testing of
refillable seamless steel gas
cylinders and tubes —**

**Part 4:
Stainless steel cylinders with an R_m
value of less than 1 100 MPa**

*Bouteilles à gaz — Conception, construction et essais des
bouteilles à gaz et des tubes rechargeables en acier sans
soudure —*

*Partie 4: Bouteilles en acier inoxydable ayant une valeur de R_m
inférieure à 1 100 MPa*

**Third edition
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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 document 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).

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This document was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 3, *Cylinder design*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 23, *Transportable gas cylinders*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 9809-4:2021), which has been technically revised.

The main changes are as follows:

- modification of definition in [3.8](#);
- modification of [Formula 1](#) in [7.2](#);
- bend test and flattening test moved under [Clause 9](#) (prototype tests);
- clarification of shear stress calculation for parallel threads;
- clarification of [9.4](#);
- update of Bibliography.

A list of all parts in the ISO 9809 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides a specification for the design, construction, inspection and testing of a seamless stainless steel cylinder. The objective is to balance the design and economic efficiency against international acceptance and universal utility.

ISO 9809 (all parts) aims to eliminate the concern about climate, duplicate inspections and restrictions because of the lack of definitive International Standards.

This document has been written so that it is suitable to be referenced in the UN Model Regulations^[1].

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Gas cylinders — Design, construction and testing of refillable seamless steel gas cylinders and tubes —

Part 4:

Stainless steel cylinders with an R_m value of less than 1 100 MPa

1 Scope

This document specifies the minimum requirements for the materials, design, construction and workmanship, manufacturing processes, examinations and testing at time of manufacture for refillable, seamless, stainless steel gas cylinders with water capacities up to and including 150 l.

It is applicable to cylinders for compressed, liquefied and dissolved gases with a maximum actual tensile strength, R_{ma} , of less than 1 100 MPa.

NOTE If so desired, cylinders of water capacity between 150 l and 450 l can be manufactured to be in full conformance to this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 3651-2, *Determination of resistance to intergranular corrosion of stainless steels — Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in media containing sulfuric acid*

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

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

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

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

ISO 9329-4, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 4: Austenitic stainless steels*

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

ISO 10286, *Gas cylinders — Vocabulary*

ISO 13341, *Gas cylinders — Fitting of valves to gas cylinders*

ISO 13769, *Gas cylinders — Stamp marking*