

Second edition  
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## **Gas cylinders — Refillable composite reinforced tubes of water capacity between 450 l and 3000 l — Design, construction and testing**

*Bouteilles à gaz — Tubes composites renforcés rechargeables d'une capacité de 450 l à 3000 l — Conception, construction et essais*



Reference number  
ISO 11515:2022(E)

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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](http://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](http://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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This second edition cancels and replaces the first edition (ISO 11515:2013), which has been technically revised. It also incorporates the Amendment, ISO 11515:2013/Amd.1:2018. The main changes are as follows:

- the references have been updated;
- a resin shear strength test was added to the document and to [Tables 2, 3 and 4](#),
- in [8.5.10](#), fire resistance test, the procedure has been changed to make the test more consistent;
- the criteria in [8.5.10.3](#) has been revised;
- in [8.5.15](#), gas cycle test, a new procedure has been added for the test to have a lower number of cycles but with a significant hold time at pressure.

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](http://www.iso.org/members.html).

## Introduction

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

This document aims to eliminate the concern about climate, duplicate inspection and restrictions currently existing because of a lack of definitive International Standards and should not be construed as reflecting on the suitability of the practice of any nation or region.

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

Composite tubes can be used alone or in batteries to equip trailers or skids (ISO modules) or multiple element gas containers (MEGCs) for the transportation and distribution of gases. This document does not include consideration of any additional stresses that can occur during service or transport (e.g. torsional/bending stresses). However, it is important that the stresses associated with mounting the tube are considered by the assembly manufacturer and the tube manufacturer.