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BSI Standards Publication

**Gas cylinders - Gases and gas mixtures -  
Determination of fire potential and oxidizing  
ability for the selection of cylinder valve outlets**

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## National foreword

This British Standard is the UK implementation of EN ISO 10156:2017. It supersedes BS EN ISO 10156:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PVE/3/1, Gas containers - Valve fittings for gas containers.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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English Version

## Gas cylinders - Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets (ISO 10156:2017)

Bouteilles à gaz - Gaz et mélanges de gaz -  
Détermination du potentiel d'inflammabilité et  
d'oxydation pour le choix des raccords de sortie de  
robinets (ISO 10156:2017)

Gasflaschen - Gase und Gasgemische - Bestimmung der  
Brennbarkeit und des Oxidationsvermögens zur  
Auswahl von Ventilausgängen (ISO 10156:2017)

This European Standard was approved by CEN on 19 August 2017.

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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN ISO 10156:2017) 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 February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 10156:2010.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 10156:2017 has been approved by CEN as EN ISO 10156:2017 without any modification.

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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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings*.

This fourth edition cancels and replaces the third edition (ISO 10156:2010), which has been technically revised. It also incorporates ISO 10156:2010/Cor 1:2010.

The main changes compared to the previous edition are as follows:

- [4.1](#), [4.2.5](#) and [4.4](#) have been technically revised;
- [4.5](#) and [4.6](#) have been added.

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## Introduction

ISO 5145 specifies the dimensions of different cylinder valve outlets for different compatible gas groups. These compatible gas groups are determined according to practical criteria defined in ISO 14456.

These criteria are based on certain physical, chemical, toxic and corrosive properties of the gases. In particular, the flammability in air and the oxidizing ability are considered in this document.

One of the potential complications that prompted the development of this document is that while there are abundant data in the literature relating to pure gases, differences can be found, depending upon the test methods employed. In the case of gas mixtures, data in the literature are often incomplete or even non-existent.

The initial aim of this document was to eliminate the ambiguities in the case of differences in the literature, and above all, to supplement existing data (mainly in the case of gas mixtures).

Subsequently, this document was used for other purposes than the selection of cylinder valve outlets, such as establishing flammability and oxidizing potential data for the classification and labelling of gases and gas mixtures.

This document is intended to be used under a variety of national regulatory regimes, but has been written so that it is suitable for the application of the UN Model Regulations and the UN-GHS<sup>[9]</sup>.

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# Gas cylinders — Gases and gas mixtures — Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets

## 1 Scope

This document specifies methods for determining whether or not a gas or gas mixture is flammable in air and whether a gas or gas mixture is more or less oxidizing than air under atmospheric conditions.

This document is intended to be used for the classification of gases and gas mixtures including the selection of gas cylinder valve outlets.

This document does not cover the safe preparation of these mixtures under pressure and at temperatures other than ambient.

## 2 Normative references

There are no normative references in this document.

## 3 Terms, definitions, symbols and units

### 3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1.1

##### **gas or gas mixture flammable in air**

gas or gas mixture that is ignitable in air at atmospheric pressure and a temperature of 20 °C

#### 3.1.2

##### **lower flammability limit in air**

minimum content of a gas or gas mixture in a homogeneous mixture with air at which a flame just starts to propagate

Note 1 to entry: The lower flammability limit is determined at atmospheric conditions.

Note 2 to entry: The term “flammability limit”, as used in this document, is sometimes called “explosion limit”.

#### 3.1.3

##### **upper flammability limit in air**

maximum content of a gas or gas mixture in a homogeneous mixture with air at which a flame just starts to propagate

Note 1 to entry: The upper flammability limit is determined at atmospheric conditions.

Note 2 to entry: The term “flammability limit”, as used in this document, is sometimes called “explosion limit”.