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

*Gaz et mélanges de gaz — Détermination du potentiel d'inflammabilité
et d'oxydation pour le choix des raccords de sortie de robinets*



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Terms, definitions, symbols and units	1
2.1 Terms and definitions	1
2.2 Symbols	2
2.3 Units	3
3 Flammability of gases and gas mixtures in air	3
3.1 General	3
3.2 Test method	3
3.2.1 Key points concerning safety	3
3.2.2 Principle	3
3.2.3 Test apparatus and materials	3
3.2.4 Procedure	4
3.2.5 Results for pure gases	4
3.3 Calculation method for mixtures containing n flammable gases and p inert gases	7
3.4 Examples	11
3.5 Classification according to the Globally Harmonized System (GHS)	12
4 Oxidizing power of gases and gas mixtures	12
4.1 General	12
4.2 Test method	12
4.2.1 Key points concerning safety	12
4.2.2 Principle	12
4.2.3 Test apparatus	13
4.2.4 Procedure	16
4.2.5 Results	16
4.3 Calculation method	16
4.3.1 Principle	16
4.3.2 C_i coefficients	17
5 Mixtures containing oxygen and flammable gases	18
5.1 General	18
5.2 Basis of flammability classification	20
5.3 Examples	22
Annex A (informative) Classification according to the Globally Harmonized System (GHS)	24
Bibliography	25

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 10156 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings*.

This third edition of ISO 10156 cancels and replaces ISO 10156:1996 and ISO 10156-2:2005.

It gives updated data for flammability and oxidizing ability.

Introduction

ISO 5145 ^[1] and other related standards establish practical criteria for the determination of outlet connections of cylinder valves. These criteria are based on certain physical and chemical properties of the gases. In particular, the flammability in air and the oxidizing ability are considered.

One of the potential complications that prompted the development of this International Standard is that whilst 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 International Standard 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 International Standard was used for other purposes than the selection of cylinder valve outlets, such as establishing flammability and oxidizing potential data for labelling according to international transport regulations and dangerous substances regulations, under the umbrella of the Globally Harmonized System (GHS).

This document is a preview generated by EVS

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

1 Scope

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

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

2 Terms, definitions, symbols and units

2.1 Terms and definitions

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

2.1.1

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

2.1.2

lower flammability limit in air

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

NOTE 1 The lower flammability limit is determined at atmospheric conditions.

NOTE 2 The term “flammability limit”, as used in this International Standard, is sometimes called “explosion limit”.

2.1.3

upper flammability limit in air

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

NOTE 1 The upper flammability limit is determined at atmospheric conditions.

NOTE 2 The term “flammability limit”, as used in this International Standard, is sometimes called “explosion limit”.

2.1.4

flammability range

range of concentration between the lower and upper flammability limits

NOTE The term “flammability range”, as used in this International Standard, is sometimes also called “explosion range”.