

**CGA G-4.4—2012**

**OXYGEN PIPELINE AND  
PIPING SYSTEMS**

**FIFTH EDITION**



## PREFACE

As part of a program of harmonization of industry standards, the European Industrial Gases Association (EIGA) and the Compressed Gas Association (CGA) formed an ad hoc task force with the goal of combining the separate oxygen pipeline standards of each organization into one harmonized standard on oxygen pipelines. This standard is intended as a joint EIGA/CGA international harmonized standard for the use and application of all members of EIGA and CGA worldwide. The CGA edition is identical in technical content to the EIGA edition except for regional regulatory requirements (noted), and it has minor changes in formatting and spelling.

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Work Item 07-013  
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NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendices A, B, and E (Informative) are required.

NOTE—Appendices C, D, and F (Normative) are for information only.

FIFTH EDITION: 2012  
FOURTH EDITION: 2003

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## 1 Introduction

This publication has been prepared by a group of specialists in oxygen pipings and pipeline systems, representing major oxygen producers in various countries of Europe and North America and is based on the technical information and experience currently available to the authors.

The industrial gases companies have engaged, through the International Harmonization Council (IHC), comprised of the Asia Industrial Gases Association (AIGA), Compressed Gas Association (CGA), European Industrial Gases Association (EIGA), and Japan Industrial and Medical Gases Association (JIMGA) in a process of developing harmonized safety practices and this publication is one of them.

It must be recognized, however, that oxygen pipeline systems developed over 40 years in the various countries of Europe and North America have shown good and comparable safety records, although national practices show many differences in design and operations. Some national authorities have also introduced legislation that is mandatory for the operators in those countries.

The information contained in this publication applies only to future installations and not to existing installations. However, the information contained in this publication may benefit existing installations or those in the project phase. Furthermore, to the extent that they exist, national laws supersede the suggested practices listed in this publication. It should not be assumed that every local standard, test, safety procedure, or method is contained in these recommendations or that abnormal or unusual circumstances may not warrant additional requirements or procedures. The authors make no representations or warranties on the information in or the completeness of this publication and disclaim all warranties, express or implied including, but not limited to, the warranty of merchantability and the warranty of fitness for a particular use or purpose.

ISO units and corresponding Imperial units in parentheses are used in this publication. Corresponding values may be approximate.

## 2 Scope and purpose

The scope of this publication is for metal oxygen pipelines, distribution piping systems, and gaseous oxygen piping on an air separation plant external to the coldbox. It is limited to gaseous oxygen with a temperature range between  $-22\text{ }^{\circ}\text{F}$  and  $400\text{ }^{\circ}\text{F}$  ( $-30\text{ }^{\circ}\text{C}$  and  $200\text{ }^{\circ}\text{C}$ ), pressures up to 3000 psi (21 MPa) and a dew point of  $-22\text{ }^{\circ}\text{F}$  ( $-30\text{ }^{\circ}\text{C}$ ) or lower depending on local conditions.<sup>1</sup>

This publication does not apply to the following processes:

- oxygen cylinder filling plants;
- medical oxygen piping installations;
- coldbox internal piping;
- oxygen compressor units;
- liquid compressor units;
- bulk oxygen facilities (liquid or high pressure gas) at the customer's site up to the point where gas enters the distribution systems; or
- piping on specialized equipment and machines such as scarfing, jet piercing, etc.

The purpose of this publication is to further the understanding of those engaged in the safe design, operation, and maintenance of gaseous oxygen transmission and distribution systems. It is not intended to be a mandatory standard or code.

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<sup>1</sup> kPa and MPa shall indicate gauge pressure unless otherwise noted as (kPa, abs and MPa, abs) for absolute pressure or (kPa, differential or MPa, differential) for differential pressure. All kPa values are rounded off per CGA P-11, *Metric Practice Guide for the Compressed Gas Industry* [1].