CGA
Compressed Gas Association
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3RD EDITION

CGA G-4.14 — 2024

DESIGN, MANUFACTURE, INSTALLATION, OPERATION, AND MAINTENANCE OF VALVES USED IN LIQUID OXYGEN AND COLD GASEOUS OXYGEN SYSTEMS

PREFACE

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has issued CGA G-4.14, *Design, Manufacture, Installation, Operation, and Maintenance of Valves Used in Liquid Oxygen and Cold Gaseous Oxygen Systems* jointly produced by members of the International Harmonization Council and originally published by the European Industrial Gases Association (EIGA) as EIGA Doc 200, *Design, Manufacture, Installation, Operation, and Maintenance of Valves Used in Liquid Oxygen and Cold Gaseous Oxygen Systems*.

This publication is intended as an international harmonized standard for the worldwide use and application of all members of the Asia Industrial Gases Association (AIGA), Compressed Gas Association (CGA), European Industrial Gases Association (EIGA), and Japan Industrial and Medical Gases Association (JIMGA). Each association's technical content is identical, except for regional regulatory requirements and minor changes in formatting and spelling.

PLEASE NOTE

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This document is subject to periodic review, and users are cautioned to obtain the latest edition. The Association invites comments and suggestions for consideration. In connection with such review, any such comments or suggestions will be fully reviewed by the Association after giving the party, upon request, a reasonable opportunity to be heard. Proposed changes may be submitted via the Internet at our web site, www.cganet.com.

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A listing of all publications, audiovisual programs, safety and technical bulletins, and safety posters is available via the Internet at our website at www.cganet.com. For more information contact CGA at Phone: 703-788-2700, ext. 799. E-mail: customerservice@cganet.com.

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Atmospheric Gases and Equipment Committee

NOTE—Technical changes from the previous edition are underlined.

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1 Introduction

This publication has been prepared by a group of experts in industrial gases technology or oxygen equipment representing oxygen manufacturers and is based on technical information and experience currently available.

The use of incompatible materials, unsuitable lubricants, improper cleaning and/or ingress of impurities, and procedural failures have been identified as root causes of a number of severe incidents that occurred over the past few years involving liquid oxygen valves with concentrations greater than 90 mol% of oxygen. This indicates the need for continual improvement in the fundamental knowledge of design, material selection, manufacturing, cleaning, installation, operation, maintenance processes, and storage related to valves in liquid oxygen service. This is necessary for liquid oxygen valve specifiers, suppliers, and manufacturers as well as those who clean, assemble, install, operate, and maintain these valves.

In order to avoid similar incidents with potentially fatal consequences, requirements for cold oxygen systems are outlined in this publication.

The industrial gases industry has demonstrated that personnel who are involved in the design, selection, manufacturing, handling, cleaning, installation, and maintenance of valves in cold oxygen service require training in these respective areas.

2 Scope

This publication covers isolation valves, control valves, check valves, pressure relief valves, drain, and vent valves in air separation units (ASUs), their backup and storage piping system, and customer station bulk storage tank systems. It addresses the design, material selection, manufacturing, cleaning, installation, operation, and maintenance of oxygen service valves operating at temperatures less than –22 °F (–30 °C).

The information contained in this publication only applies to new installations designed after the publication of this document 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 may supersede the practices included in this publication. It should be noted that all local regulations, tests, safety procedures, or methods are not included in this publication and that abnormal or unusual circumstances could warrant additional requirements.

Valves in warm service connecting instrumentation devices are excluded from the scope of this publication. Some of the principles discussed in this publication may be used for other cold oxygen applications.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Publication terminology

3.1.1 Shall
Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should
Indicates that a procedure is recommended.

3.1.3 May
Indicates that the procedure is optional.

3.1.4 Will
Used only to indicate the future, not a degree of requirement.

3.1.5 Can
Indicates a possibility or ability.