CGA G-4.14—2015

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

FIRST EDITION

CGA
Compressed Gas Association
The Standard For Safety Since 1913

PREFACE

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has issued CGA G-4.14, *The Safe 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, *The Safe 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.

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1 Introduction

This publication has been prepared by a group of experts in air separation 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 involving liquid oxygen valves with concentrations greater than 90 mol%, which occurred over the past few years. This indicates the need for continual improvement in the fundamental knowledge of design, material selection, manufacturing, cleaning, installation, operation, and maintenance processes 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 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.

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, and drain and vent valves in air separation units (ASUs) and their backup and storage piping system. It addresses the design, material selection, manufacturing, cleaning, installation, operation, and maintenance of oxygen service valves operating at temperatures below –22 °F (–30 °C).

Valves in warm service connecting instrumentation devices are excluded from the scope of this publication.

Although this publication is for ASUs, some of the principles may be used for other cold oxygen installations.

3 Definitions

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.