



CGA P-1—2015
STANDARD FOR SAFE
HANDLING OF COMPRESSED
GASES IN CONTAINERS

TWELFTH EDITION

PLEASE NOTE:

The information contained in this document was obtained from sources believed to be reliable and is based on technical information and experience currently available from members of the Compressed Gas Association, Inc. and others. However, the Association or its members, jointly or severally, make no guarantee of the results and assume no liability or responsibility in connection with the information or suggestions herein contained. Moreover, it should not be assumed that every acceptable commodity grade, test or safety procedure or method, precaution, equipment or device is contained within, or that abnormal or unusual circumstances may not warrant or suggest further requirements or additional procedure.

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.

This document should not be confused with federal, state, provincial, or municipal specifications or regulations; insurance requirements; or national safety codes. While the Association recommends reference to or use of this document by government agencies and others, this document is purely voluntary and not binding unless adopted by reference in regulations.

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.

Work Item 12-042
Safety and Health Committee

NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendix A (Normative) is a requirement.

TWELFTH EDITION: 2015
ELEVENTH EDITION: 2008
TENTH EDITION: 2006
NINTH EDITION: 2000

© 2015 The Compressed Gas Association, Inc. All rights reserved.

All materials contained in this work are protected by United States and international copyright laws. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying, recording, or any information storage and retrieval system without permission in writing from The Compressed Gas Association, Inc. All requests for permission to reproduce material from this work should be directed to The Compressed Gas Association, Inc., 8484 Westpark Drive, Suite 220, McLean, VA 22102. You may not alter or remove any trademark, copyright or other notice from this work.

Contents	Page
1 Introduction.....	1
2 Scope	1
3 Definitions.....	1
4 Regulations and standards applicable to compressed gases in containers.....	5
4.1 Transportation regulating authorities.....	5
4.2 Container regulations	5
4.3 Container filling regulations	5
4.4 Regulating authorities of workplace safety and health	6
5 General safe handling rules for compressed gas containers	6
5.1 Personnel	6
5.2 Content identification	6
5.3 User responsibilities	6
5.4 General precautions	7
5.5 Valve protection caps and valve outlet caps and plugs.....	7
5.6 Safe handling of containers	8
5.7 Transfilling	8
5.8 Storing containers.....	8
5.9 Connecting a container and withdrawing its content	9
5.10 Transportation in passenger vehicles.....	11
5.11 Emergency response	11
6 Safe handling and storage rules for compressed gas by hazard class	12
6.1 Hazard class.....	12
6.2 Flammable gases	13
6.3 Asphyxiant gases (including inert).....	15
6.4 Oxidizing gases	15
6.5 Corrosive and toxic gases	16
6.6 Gas mixtures	17
6.7 Cryogenic liquids	17
7 Precautions for tank cars, cargo, and portable tanks	18
8 Security issues	19
8.1 Facility security	19
8.2 Distribution security	20
9 References	20
10 Additional references.....	23
 Appendix	
Appendix A—Cylinder nesting (Normative).....	25
 Appendix Figures	
Figure A-1—Properly nested cylinders	25
Figure A-2—Improperly nested cylinders.....	25

This page is intentionally blank.

1 Introduction

Users of compressed gas shall become familiar with the properties and inherent hazards of the products they use. Valuable information about each specific gas is contained in its product labeling and safety data sheet (SDS). Read this information and inform others of the importance of understanding and applying the precautions established within the available safety literature.

The user is cautioned that hazard classification systems exist for labeling, storage, transportation, security, and other purposes, particularly from regulatory agencies, which can result in a different assessment of the hazard. In addition, there can be additional hazards not addressed in this standard; therefore, the user should consult the gas supplier's SDS for specific information. See Title 29 of the U.S. Code of Federal Regulations (29 CFR); CGA C-7, *Guide to Classification and Labeling of Compressed Gases*; and CGA P-19, *CGA Recommended Hazard Ratings for Compressed Gases* [1, 2, 3].¹ The user should perform due diligence to research any necessary codes or regulations that can affect the use of these products.

2 Scope

This standard is primarily for the users of compressed gases in containers and is based upon accepted good practices. This standard also contains precautions that are applicable to gas suppliers and distributors. It should not be assumed that all applicable safety and security precautions or regulations are contained here.

The term “container” as used in this publication shall refer to portable compressed gas cylinders and liquid containers made in accordance with the U.S. Department of Transportation (DOT), Transport Canada (TC), or the American Society of Mechanical Engineers (ASME) specifications [4, 5, 6]. Additional information covering small cylinders can be found in CGA SB-27, *Safe Use and Handling of Small Cylinders* [7].

Additional information and requirements contained in CGA P-2, *Characteristics and Safe Handling of Medical Gases*, and other related publications it references should be reviewed when handling medical gases [8].

3 Definitions

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

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. Shall 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

Indicate that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

¹ References are shown by bracketed numbers and are listed in order of appearance in the reference section.