

CGA V-6—2008

**STANDARD BULK
REFRIGERATED
LIQUID TRANSFER
CONNECTIONS**

FIFTH EDITION



**COMPRESSED GAS ASSOCIATION, INC.
4221 Walney Road, 5th Floor
Chantilly, VA 20151
Phone: 703-788-2700
Fax: 703-961-1831
E-mail: cga@cganet.com**

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 09-035
Bulk Distribution Equipment and Standards Committee

NOTE—Technical changes from the previous edition are underlined.

FIFTH EDITION: 2008
REAFFIRMED: 2006
FOURTH EDITION: 2000
THIRD EDITION: 1993
SECOND EDITION: 1986

© 2008 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., 4221 Walney Road, Suite 500, Chantilly VA 20151. You may not alter or remove any trademark, copyright or other notice from this work.

Contents	Page
1 Introduction.....	1
2 Scope and purpose	1
2.1 Scope	1
2.2 Purpose	2
3 Definitions.....	2
3.1 Standard connections.....	2
3.2 Obsolete/limited standard connections.....	2
3.3 Maximum allowable working pressure (MAWP)	2
4 Standard connection components.....	2
4.1 Nut.....	2
4.2 Headpiece	2
4.3 Fixed end.....	2
4.4 Gasket	2
4.5 O-ring.....	2
5 Design considerations	2
5.1 Prevention of cross connection	2
5.2 Sizes and functions of connections	3
5.3 Materials of construction.....	3
5.4 Pressure rating	3
5.5 Marking.....	3
5.6 Use of adapters in product transfers	3
5.7 Lugs on nut.....	4
5.8 Headpiece protection	4
5.9 Cleaning	4
6 References	4
7 Additional References	4

Table

Table 1—Assignment of standard connections.....	1
---	---

Appendices

Appendix A—Standard connections	5
Appendix B—Obsolete/limited standard connections	22

Appendices Tables

Table A-1—Letter code description for dimensions on drawings of standard connections.....	5
Table B-1—Letter code description for dimensions on drawings of obsolete/limited standard connections.....	22

This page is intentionally blank.

1 Introduction

Before the design and evolution of standard connections, each company involved in liquid transport used a variety of proprietary connections. CGA member companies recognized a need for development of a standardized fittings system and selected specific designs for evaluation.

Prototypes were produced for testing starting in 1972. Tests were then conducted to ensure that connections could be made to prototypes submitted by each of the companies and could not be connected to fittings for products other than those intended. A one-year test was carried out in specific geographical areas where interfaces between the existing and proposed standard fittings were least likely. The results of this test program were deemed successful.

2 Scope and purpose

2.1 Scope

Liquid (and vapor) transfer connections for the industrial gases listed in Table 1 are specified in this standard. An obsolete/limited standard flanged connection system for oxygen, nitrogen, and argon is also specified. The specified connections are intended for use with liquid transport equipment, such as cargo tanks, portable tanks, and railway tank cars but do not apply to barges and marine tankers. Termination points at liquid production plants and on stationary storage vessels that directly interface with this transport equipment are also included. The connections in this standard are intended for use exclusively with the specified products. These connections are not intended for use on uninsulated or insulated (DOT 4L) cylinders, tubes, or on small equipment using connections less than 1 in (25 mm). The physical design of the fittings, other than the connection configuration at the coupling point, is also beyond the scope of this standard.

Specialized vacuum-jacketed bayonet connections, which are required for some cryogenic products, are not included in this standard.

Table 1—Assignment of standard connections

Product	Size		Standard connection number
	in	mm	
Argon	1-1/2	38	AR-15
	2-1/2	64	AR-25
<u>Carbon Dioxide</u>	<u>1</u>	<u>25</u>	<u>CO₂-10</u>
	<u>1-1/2</u>	<u>38</u>	<u>CO₂-15</u>
	<u>2</u>	<u>51</u>	<u>CO₂-20</u>
	<u>3</u>	<u>76</u>	<u>CO₂-30</u>
	<u>4</u>	<u>102</u>	<u>CO₂-40</u>
Liquefied natural gas (LNG)	3	76	LNG-30
Nitrogen	1-1/2	38	NI-15
	2-1/2	64	NI-25
	3	76	NI-30
<u>Nitrous oxide</u>	<u>1</u>	<u>25</u>	<u>N₂O-10</u>
	<u>1-1/2</u>	<u>38</u>	<u>N₂O-15</u>
Oxygen	1-1/2	38	OX-15
	2	51	OX-20
	3	76	OX-30