

CGA C-11—2019

**PRACTICES FOR INSPECTION OF
COMPRESSED GAS CYLINDERS
AT TIME OF MANUFACTURE**

SIXTH EDITION

CGA
Compressed Gas Association
The Standard For Safety Since 1913

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 18-005
Cylinder Specifications Committee

NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendices A through H (Normative) are requirements.

SIXTH EDITION: 2019
FIFTH EDITION: 2013
FOURTH EDITION: 2006
THIRD EDITION: 2001

© 2019 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., 14501 George Carter Way, Suite 103, 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	1
3 Definitions.....	1
4 Qualifications of the certifying inspector	3
5 Inspection requirements—seamless cylinders.....	3
5.1 Duties of certifying inspector	3
5.2 Inspection practices.....	4
6 Inspection requirements—welded and brazed cylinders.....	7
6.1 Duties of certifying inspector	7
6.2 Inspection practices.....	8
7 Inspection requirements—nonrefillable cylinders.....	11
7.1 Duties of certifying inspector	11
7.2 Inspection practices.....	11
8 Inspection requirements—composite cylinders.....	13
8.1 Duties of certifying inspector	13
8.2 Inspection practices.....	14
9 References	16

Appendices

Appendix A—Certificate of compliance and test report—seamless cylinders (Normative).....	17
Appendix B—Certificate of compliance and test report— welded or brazed cylinders (Normative)	18
Appendix C—Certificate of compliance and test report— completed acetylene cylinders (Normative).....	19
Appendix D—Record of chemical analysis of material for cylinders (typical form) (Normative)	20
Appendix E—Record of physical test of material for cylinders (typical form) (Normative).....	21
Appendix F—Record of volumetric expansion tests of cylinders (typical form) (Normative).....	22
Appendix G—Record of volumetric expansion tests of cylinders (sample basis) (typical form) (Normative).....	23
Appendix H—Inspection report covering the manufacture of specification DOT-39/TC-39M cylinders or spheres (Normative)	24

This page is intentionally blank.

1 Introduction

Specification tests and inspection procedures are necessary to ensure compliance with applicable specifications. However, specifications and inspection procedures are distinctly different and have to be separated. A product specification is legislative while inspection procedures are judicial.

Acceptance and certification of a product to a given specification is usually in batch or lot size quantities and can be based on testing or inspection frequencies from 100% of product for certain attributes to one item per lot for other attributes. Between these extremes, intermediate frequencies of examination are permitted to allow the inspector to certify acceptance of a lot to a given specification. In no case shall the frequency of specific inspections or tests be less than required by applicable specifications.

Aside from frequency of testing, the method of arriving at decisions concerning compliance is vital. One important distinction is the difference between witnessing and verifying. Witnessing implies a physical presence, whereas verifying usually involves gaining information without physical presence by examining records or statements of other persons in whom trust has been placed.

For U.S. Department of Transportation (DOT) regulations, either witnessing or verifying may be delegated by the certifying inspector, but this individual retains responsibility for the decision. Where an independent inspection agency (IIA) is required by specification, the delegation of witnessing and verification is limited to an agency employee.

For Canadian regulations, the inspections shall be performed by the staff of the independent inspector as described in the application for registration.

Calibration of testing and inspection equipment used to validate the certificate of compliance and test report shall be performed on a regularly scheduled basis by qualified persons to ensure accuracy.

2 Scope and purpose

2.1 Scope

This publication is applicable to cylinders, tubes, and spheres, hereafter referred to as cylinders, and to inspection by either an approved IIA or inspectors of the manufacturer.

2.2 Purpose

The purpose of this publication is to promote safety by outlining inspection requirements of DOT in Title 49 of the U.S. *Code of Federal Regulations*, CSA B339, *Cylinders, spheres, and tubes for the transportation of dangerous goods*, and CSA B341, *UN pressure receptacles and multiple-element gas containers for the transport of dangerous goods* as adopted by the *Transportation of Dangerous Goods Regulations* of Transport Canada (TC) for cylinders as interpreted and practiced by manufacturers and inspectors [1, 2, 3, 4].¹

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.

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