Compressed Gas Association
The Standard For Safety Since 1913

CGA C-5—2022

WALL STRESS REQUALIFICATION CRITERIA FOR HIGH PRESSURE SEAMLESS STEEL CYLINDERS

EIGHTH EDITION

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Work Item 21-054
Cylinder Specifications Committee

NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendix A (Informative) is for information only.

NOTE—Appendices B and C (Normative) are requirements.

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1 Introduction

Compressed gas cylinders manufactured in accordance with U.S. Department of Transportation (DOT) or Transport Canada (TC) specifications can remain safe unless damaged by corrosion, accident, or abuse.[1] A cylinder shall be accepted or rejected for special filling limits on the basis of the criteria set forth in this publication. Other methods for qualification may be used such as the satisfactory completion of an ultrasonic examination or acoustic emission test, conducted in accordance with a current DOT special permit or TC equivalency certificate.

2 Scope

This publication contains detailed methods of determining average wall thickness that can be applied to the requalification of seamless, high pressure cylinders conforming to Specifications ICC-3, ICC/DOT-3A, DOT-3AX, DOT-3AA, DOT-3AAX, and DOT-3T as well as the equivalent Canadian specifications. The water jacket hydrostatic test shall be performed in accordance with CGA C-1, *Methods for Pressure Testing Compressed Gas Cylinders and Tubes* [1].[2] The visual inspection shall be performed in accordance with CGA C-6, *Standard for Visual Inspection of Steel Compressed Gas Cylinders* [2].

The flow chart contained in Appendix A graphically illustrates the service life control procedures described in this publication. The procedures required to qualify cylinders for special filling limits in accordance with DOT and TC regulations are provided in Appendices B and C, respectively.

The suggestions contained in this publication do not apply to cylinders manufactured under specification DOT-3HT, CTC-3HT, or TC-3HTM. Because of the special provisions of this specification, separate recommendations covering service life and standards for visual inspection of these cylinders are contained in CGA C-8, *Standard for Requalification of DOT-3HT, CTC-3HT, and TC-3HTM Seamless Steel Cylinders* [3].

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

3.1.5 Can
Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Requalification
Test(s) required to be performed on a cylinder to determine its suitability for continued service.

[1] In 1967, DOT was established and, among other things, assumed responsibility for the safety regulations formerly administered by the Interstate Commerce Commission (ICC) over explosives and other dangerous articles. These are now known as the Hazardous Materials Regulations of DOT and specifications for cylinders are included in these regulations. Wherever reference is made to DOT cylinders, it is equally applicable to similar cylinders marked ICC and the same cylinders made to Canadian regulations, which may be marked TC, CTC (Canadian Transport Commission), BTC (Board of Transport Commissioners for Canada), or CRC (Canadian Railway Commission).

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