CGA

Compressed Gas Association

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REQUALIFICATION STANDARD FOR METALLIC, DOT AND TC 3-SERIES GAS CYLINDERS AND TUBES USING ULTRASONIC TESTING

THIRD EDITION

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Work Item 17-033
Cylinder Specifications Committee

NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendices A and D (Informative) are for information only.

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

THIRD EDITION: 2021
SECOND EDITION: 2014
FIRST EDITION: 2005

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1 Introduction

This standard is used for the requalification of metallic seamless cylinders and tubes using ultrasonic testing (UT).

UT of cylinders and tubes provides for measurement of wall thickness and detection of both internal and external pits, cracks, and other flaws that cannot be easily discerned by visual inspection or hydrostatic test methods. UT can be performed without removal of the valve and contents.

A cylinder or tube that has been rejected by UT shall not be subsequently requalified for continued service by the use of the hydrostatic test method.

WARNING: *Cylinder requalification can subject the personnel performing examinations to certain hazards such as exposure to containers under pressure and flammable or toxic gases, which can result in death or serious injury.*

2 Scope

This standard identifies and describes the various acceptable UT methods (also known as ultrasonic examination [UE] methods) that may be used in place of internal visual inspection and hydrostatic requalification methods used to examine certain metallic, U.S. Department of Transportation (DOT)/Transport Canada (TC) 3-series gas cylinders and tubes as mandated by Title 49 of the U.S. *Code of Federal Regulations* (49 CFR) and TC's *Transportation of Dangerous Goods Regulations*, and cylinders manufactured under certain DOT special permits or TC equivalency certificates [1, 2].[1] This standard also specifies the allowable flaw acceptance/rejection criteria to be used. This standard may also be applied to other seamless steel and aluminum alloy cylinders and tubes when authorized by the regulatory authority.

Aluminum alloy cylinders susceptible to sustained load cracking such as those manufactured from 6351 aluminum alloy shall also have the shoulder and neck area internally visually inspected and an eddy current examination of neck threads completed in accordance with established regulatory requirements.

This standard does not address any safety, health, or environmental considerations associated with UT or regulations and codes. Operating procedures and processes regarding worker safety precautions and requirements shall be met. See additional references in Section 13.

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
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.