Compressed Gas Association
The Standard For Safety Since 1913

CGA S-1.1—2022
PRESSURE RELIEF DEVICE STANDARDS—PART 1—CYLINDERS FOR COMPRESSED GASES

SIXTEENTH EDITION

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Work Item 22-025
Cylinder Valve 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.

FOREWORD

On April 16, 1981, the United States Department of Transportation promulgated new regulations to 49 CFR 173.34(d), which eliminated the need for pressure relief device approval by the Bureau of Explosives of the Association of American Railroads. It is the responsibility of the individual manufacturer or shipper to conduct his own flow and/or fire tests on new pressure relief device combinations to show compliance with CGA S-1.1 and CGA C-14 as applicable, and to retain test records of the compliance.

SIXTEENTH EDITION: 2022
FIFTEENTH EDITION: 2019
FOURTEENTH EDITION: 2011
THIRTEENTH EDITION: 2007

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1 Introduction

This standard represents the minimum requirements for pressure relief devices (PRDs) considered to be appropriate and adequate for use on cylinders with a water capacity less than or equal to 1000 lb (454 kg). Refer also to Title 49 of the U.S. *Code of Federal Regulations* (49 CFR), CSA B340, *Selection and use of cylinders, spheres, tubes, and other containers for the transportation of dangerous goods, Class 2*, and/or CSA B342, *Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2* [1, 2, 3].[1] This standard also applies to composite overwrapped pressure vessels (COPVs), DOT-3AX, DOT-3AAX, and DOT-3T cylinders with a water capacity greater than 1000 lb (454 kg) as well as United Nations (UN) pressure receptacles with a water capacity up to 3000 kg, and which comply with the design specifications and charging (filling) and maintenance regulations of the U.S. Department of Transportation (DOT) or the corresponding specifications and regulations of Transport Canada (TC) [1, 4].

When cylinders that conform to the specification requirements of DOT or TC but are used in services beyond the jurisdiction of any of these authorities, it is recommended that the state, provincial/territorial, city, and other local regulatory authorities over these cylinders be guided by this standard in determining PRD requirements provided that the cylinders are charged and maintained in accordance with DOT or TC regulations.

It is further recognized that there can be cylinders that are used in services beyond the jurisdiction of DOT or TC that do not conform to the specification requirements of either authority. The authority having jurisdiction (AHJ) over such cylinders should be guided by this standard in determining PRD requirements provided that such cylinders are considered by the authority as having a construction at least equal to the equivalent DOT or TC specification requirements and they are charged and maintained in accordance with DOT or TC requirements.

A number of states, provinces/territories, cities, and other local regulatory authorities have pressure vessel laws and regulations that include requirements for PRDs. This standard is prepared specifically for compressed gas cylinders, and the PRDs may not be acceptable unless special permission is obtained from the AHJ. For cylinders that come within the jurisdiction of state, provincial/territorial, and local regulatory authorities, the user should check for compliance with all such regulations.

For newly constructed cylinders that come within the jurisdiction of DOT or TC, PRDs shall comply with requirements of this standard. The intent of this standard is to minimize the number and optimize the types of approved PRDs specified for each specific gas. This standard does not prohibit the continued use of previously approved and installed devices unless stated otherwise in this standard, 49 CFR, CSA B340, and/or CSA B342 [1, 2, 3]. However, if a PRD is replaced, the new device shall meet the requirements of this standard.

It is the filler's responsibility to ensure that the PRD is correct.

2 Scope

This standard applies to the selection of PRDs for a single component compressed gas in cylinders. For selection of PRDs for compressed gas mixtures in cylinders, see CGA S-7, *Standard Method for Selecting Pressure Relief Devices for Compressed Gas Mixtures in Cylinders* [5].

This standard does not cover PRD requirements for CTC/DOT-4L and TC-4LM insulated cylinders containing cryogenic liquids, see CGA S-1.2, *Pressure Relief Device Standards—Part 2—Portable Containers for Compressed Gases* [6]. This standard does not cover PRD requirements for multi-unit tank car tanks (DOT106A/TC106A and DOT110A-W/TC110A), see 49 CFR 179.300-15 and CGSB 43.147, *Construction, Modification, Qualification, Maintenance, and Selection and Use of Means of Containment for the Handling, Offering for Transport, or Transporting of Dangerous Goods by Rail*, as appropriate [1, 7].

This standard includes tables that provide information pertaining to PRDs. Table 1 contains information on the different types of PRDs. Table 2 provides a list of gases and their PRD assignments. Table 3 contains temperature correction factors. Table 4 includes values for basic orifice factors flange taps for flow in ft^3/minute.

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