

CGA S-1.1—2007

**PRESSURE RELIEF
DEVICE STANDARDS
PART 1—
CYLINDERS FOR
COMPRESSED GASES**

THIRTEENTH EDITION



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NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendices A and B (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 now becomes 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, CGA C-12, and CGA C-14 as applicable, and to retain test records of the compliance.

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1 Introduction

This standard represents the minimum requirements for pressure relief devices considered to be appropriate and adequate for use on cylinders having capacities of 1000 lb (454 kg) of water or less. Refer also to Title 49 of the U.S. *Code of Federal Regulations* (49 CFR) 173.301(f) [1].¹ This standard also applies to DOT-3AX, DOT-3AAX, and DOT-3T cylinders having capacities over 1000 lb (454 kg) of water, and which comply with the design specifications and charging and maintenance regulations of the U.S. Department of Transportation (DOT) or the corresponding specifications and regulations of Transport Canada (TC) [1, 2]. This standard also covers requirements for pressure relief devices for CTC/DOT-4L and TC-4LM insulated cylinders containing cryogenic liquids. Pressure relief device requirements for multi-unit tank car tanks (DOT106A and DOT110A-W) are not covered by this standard (see 49 CFR 179.300-15) [1].

This standard includes Tables 1 to 6, which provide information pertaining to pressure relief devices. Table 1 contains information on the different types of pressure relief devices. Table 2 contains FTSC code classification for gases. Table 3 contains a listing of gases and their pressure relief device assignments. Table 4 contains temperature correction factors. Table 5 includes values for basic orifice factors flange taps for flow in cubic feet per minute. Table 6 contains values of G_r and G_v for rated burst pressure of rupture disks for CTC/DOT-4L and TC-4LM cylinders.

It is recognized that there are cylinders that conform to the specification requirements of DOT or TC, but are used in services beyond the jurisdiction of any of these authorities. In such cases, it is recommended that state, provincial/territorial, local, or other authorities having jurisdiction over these cylinders be guided by this standard in determining adequate pressure relief device requirements provided that the cylinders are charged and maintained in accordance with DOT or TC regulations.

It is further recognized that there may 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. It is recommended that the authorities having jurisdiction over such cylinders be guided by this standard in determining pressure relief device 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 further provided that the cylinder shall be charged and maintained in accordance with DOT or TC requirements.

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. A number of states and cities have pressure vessel laws and regulations that include requirements for pressure relief devices. This standard is prepared specifically for compressed gas cylinders, and the pressure relief devices may not be acceptable unless special permission is obtained from the authority having jurisdiction.

For newly constructed cylinders that come within the jurisdiction of DOT or TC, pressure relief devices shall comply with requirements of this standard. This publication is based on minimizing the number and optimizing the types of approved pressure relief devices specified for each specific gas. It does not prejudice the continued use of previously approved and installed devices unless stated otherwise in Table 3 and/or 49 CFR [1]. However, if a pressure relief device is replaced, the new device shall meet the requirements of this standard.

It is the filler's responsibility to ensure that the pressure relief device is correct.

For pressure relief device standards for bulk transport containers and stationary storage containers, see CGA S-1.2, *Pressure Relief Device Standards—Part 2—Cargo and Portable Tanks for Compressed Gases*, and CGA S-1.3, *Pressure Relief Device Standards—Part 3—Stationary Storage Containers for Compressed Gases* [3, 4].

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