CGA P-1—2008

SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS

ELEVENTH EDITION

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Work Item 10-034
Safety and Health Committee

NOTE—Technical changes from the previous edition are underlined.

ELEVENTH EDITION: 2008
TENTH EDITION: 2006
NINTH EDITION: 2000
EIGHTH EDITION: 1991

Contents **Page**

Appendices

Appendix Figures

Appendix Table

1 Introduction

Users of compressed gas should become familiar with the properties and inherent hazards of the products they use. Valuable information about each specific gas is contained in its product labeling and material safety data sheet (MSDS). Read this information and inform others of the importance of understanding and applying the precautions established within the available safety literature.

2 Scope

This guideline is primarily for the users of compressed gases in containers and is based upon accepted good practices. Some precautions are also applicable to gas suppliers and distributors. It should not be assumed that all applicable safety and security precautions or regulations are contained here. The term "container" as used in this publication shall refer to portable compressed gas cylinders and liquid containers made in accordance with the U.S. Department of Transportation (DOT), Transport Canada (TC), or the American Society of Mechanical Engineers (ASME) specifications [1, 2, 3].[1] Additional information covering small cylinders can be found in CGA SB-27, *Safe Use and Handling of Small Cylinders* [4].

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Absolute pressure
Based on a zero pressure reference point such as the perfect vacuum at normal temperature and pressure.

NOTE—Absolute pressure is commonly denoted as psia or kPa, abs.[2]

3.2 Apparatus
Accessory equipment such as valves, pressure relief devices (PRDs), regulators, etc., used with compressed gas containers.

3.3 Charging
Synonym sometimes used by regulatory agencies for the word filling.

3.4 Compressed gas

3.4.1 Flammable gas
Any material that is a gas at 20 °C (68 °F) or less and 101.3 kPa (14.7 psia) of pressure (a material that has a boiling point of 20 °C [68 °F] or less at 101.3 kPa [14.7 psia]) that:

- is ignitable at 101.3 kPa (14.7 psia) when in a mixture of 13 % or less by volume with air; or
- has a flammable range at 101.3 kPa (14.7 psia) with air of at least 12 % regardless of the lower limit.

The limits specified shall be determined at 101.3 kPa (14.7 psia) of pressure and a temperature of 20 °C (68 °F) in accordance with ASTM E681-85, *Standard Test Method for Concentration Limits of Flammability of Chemicals* or other approved equivalent methods [6].

3.4.2 Nonflammable, nonpoisonous compressed gas
Any material (or mixture) that:

- exerts in the packaging an absolute pressure of 280 kPa (40.6 psia) or greater at 20 °C (68 °F); and
- does not meet the definition of a flammable gas or gas poisonous by inhalation [1].

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

[2] kPa shall indicate gauge pressure unless otherwise noted as (kPa, abs) for absolute pressure or (kPa, differential) for differential pressure. All kPa values are rounded off per CGA P-11, *Metric Practice Guide for the Compressed Gas Industry* [5].