CGA

Compressed Gas Association

The Standard For Safety Since 1913

CGA G-5.5—2021

STANDARD FOR HYDROGEN VENT SYSTEMS

FOURTH EDITION

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NOTE—Technical changes from the previous edition are underlined.

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Contents **Page**

Figure

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1 Introduction

This publication provides information for personnel who design, install, and maintain hydrogen vent systems.

2 Scope

This publication provides design guidelines for hydrogen vent systems used in gaseous and liquid hydrogen systems at user sites and provides recommendations for safe operation of these vents. It begins at the discharge port of safety devices and other components that control the release of hydrogen and ends at the point where hydrogen concentration in the atmosphere is below the lower flammable limits.

It also provides information on the production, transportation, handling, and storage of compressed hydrogen, cryogenic liquid hydrogen, and related products. Additional information on hydrogen can be found in CGA G-5, *Hydrogen*, CGA G-5.4, *Standard for Hydrogen Piping Systems at User Locations*, CGA *Handbook of Compressed Gases*, and NFPA 55, *Compressed Gases and Cryogenic Fluids Code,* and NFPA 2, *Hydrogen Technologies Code* [1, 2, 3, 4, 5].[1]

Pressure relief devices (PRDs) for cylinders and tube trailers required by U.S. Department of Transportation (DOT) in Title 49 of the U.S *Code of Federal Regulations* (49 CFR) are not covered in the scope of this publication [6].

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 ASME piping code
American Society of Mechanical Engineers (ASME) B31.12*, Hydrogen Piping and Pipelines* [7]. The process piping code in North America for hydrogen piping and pipelines.

3.2.2 Cylinder
Pressure vessel designed for pressures higher than 40 psi (276 kPa) and having a circular cross section with an internal water volume not exceeding 16 ft^3 (450 L) or a water capacity of 1000 lb (454 kg) constructed in accordance with DOT specifications for cylinders [6].[2] In Canada, *Transportation of Dangerous Goods* (TDG) regulations apply to cylinders [9].

[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, *Guideline for Metric Practice in the Compressed Gas Industry* [8].