CGA

Compressed Gas Association

The Standard For Safety Since 1913

CGA H-3—2019

STANDARD FOR CRYOGENIC HYDROGEN STORAGE

THIRD EDITION

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Work Item 17-047
Hydrogen Technology Committee

NOTE—Technical changes from the previous edition are underlined.

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

THIRD EDITION: 2019
SECOND EDITION: 2013
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1 Introduction

This publication contains the suggested minimum design and performance requirements for shop-fabricated, vacuum-insulated cryogenic tanks (vertical and horizontal) intended for above ground storage of liquid hydrogen.

2 Scope

This publication applies to liquid hydrogen storage tanks with maximum allowable working pressures (MAWP) up to and including 175 psi (1210 kPa).[1,2] Tanks less than 1000 gal (3785 L) gross volume or greater than 25 000 gal (94 600 L) gross volume and all transportable containers are excluded. Tanks outside these pressure and volume constraints may also meet the requirements of this standard when agreed upon by the purchaser/manufacturer and the authority having jurisdiction (AHJ). This standard does not include operation and installation requirements or emergency response information.

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 Ancillary equipment
Group of components used for operation of the tank including valves, gauges, fittings, telemetry systems, etc.

3.2.2 Annular space
Volumetric space between the inner vessel and outer jacket that contains insulation materials and is evacuated to lessen heat flux.

3.2.3 Annular space piping
Interconnected piping between the inner vessel and outer jacket.

3.2.4 Cold net volume
Net capacity of the inner vessel at –423 °F (–253 °C) in liters or gallons.

NOTE—This value is also referred to as the full trycock volume or the net liquid capacity of the inner vessel. It may be expressed as the cold gross volume minus the ullage (vapor space) of the inner vessel.

[1] 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* [1].

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