CGA

Compressed Gas Association

The Standard For Safety Since 1913

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THE INERT GASES: ARGON, NITROGEN, AND HELIUM

FIFTH EDITION

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NOTE—Technical changes from the previous edition are underlined.

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Contents **Page**

Tables

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1 Introduction

This publication is one of a series compiled by the Compressed Gas Association (CGA) to provide information on the transportation, handling, and storage of compressed gases, cryogenic liquids, and related products.

2 Scope

The purpose of this publication is to present information regarding the characteristics and handling of the three major inert gases—argon, nitrogen, and helium. Requests for specialized technical information should be directed to any one of the manufacturers of these gases.

This publication is intended primarily for users of the inert gases. Some of the requirements do not apply to the manufacturers or distributors of these gases.

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.

4 Argon

4.1 Properties

Argon is a colorless, odorless, and tasteless, monatomic gas that comprises approximately 1% of the atmosphere (0.934% by volume).

Argon is nontoxic, chemically inert, and only slightly soluble in water. It is nonflammable and inhibits combustion. It can act as an asphyxiant by displacing the amount of oxygen necessary to support life.

Argon gas is approximately 38% more dense than air. It can be liquefied to a colorless liquid that boils at –302.6 °F (–185.9 °C) at atmospheric pressure. Liquid argon at its normal boiling point is 39% heavier than water. Above its critical temperature of –188.1 °F (–122.3 °C), argon can exist only as a gas regardless of pressure.

Argon is classed according to type and grade (quality verification level [QVL]). Gaseous argon is denoted as Type I and liquefied argon as Type II. The grade (QVL) indicates the maximum amount of impurities that can be present. For more details, see CGA G-11.1, *Commodity Specification for Argon* [1].[1]

Some of the physical constants of argon are listed in Table 1.

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