CGA

Compressed Gas Association

The Standard For Safety Since 1913

CGA P-45—2018

FIRE HAZARDS OF OXYGEN AND OXYGEN-ENRICHED ATMOSPHERES

SECOND EDITION

PREFACE

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has issued CGA P-45, *Fire Hazards of Oxygen and Oxygen-Enriched Atmospheres*, jointly produced by members of the International Harmonization Council and originally published by the European Industrial Gases Association (EIGA) as EIGA Doc 04, *Fire Hazards of Oxygen and Oxygen-Enriched Atmospheres*.

This publication is intended as an international harmonized standard for the worldwide use and application of all members of the Asia Industrial Gases Association (AIGA), Compressed Gas Association (CGA), European Industrial Gases Association (EIGA), and Japan Industrial and Medical Gases Association (JIMGA). Each association's technical content is identical, except for regional regulatory requirements and minor changes in formatting and spelling.

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This document is subject to periodic review, and users are cautioned to obtain the latest edition. The Association invites comments and suggestions for consideration. In connection with such review, any such comments or suggestions will be fully reviewed by the Association after giving the party, upon request, a reasonable opportunity to be heard. Proposed changes may be submitted via the Internet at our web site, www.cganet.com.

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Safety and Health Committee

NOTE—Technical changes from the previous edition are underlined.

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1 Introduction

This publication explains the fire hazards resulting from handling oxygen and the relevant protective measures that should be taken.

2 Scope and purpose

The intent of this publication is to provide personnel working with oxygen, or potentially in or near oxygen-enriched atmospheres, with a high level of awareness of the fire and explosion hazards associated with these conditions. Oxygen levels less than 19.5% constitute an oxygen-deficient atmosphere and may only be entered using special precautions. See CGA SB-2, *Oxygen-Deficient Atmospheres* or EIGA Doc 44, *Hazards of inert gases and oxygen depletion* [1, 2]. [1]

Appendix A is a summary of the information in this publication suitable to be produced as a pamphlet to be handed to those involved in daily operations involving oxygen or used as a supplement to safety presentations.

Appendix B lists some incidents that have taken place in recent years that can be used as examples underlining the hazards of oxygen and oxygen-enriched atmospheres.

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 Oxygen-enriched atmosphere
Air and gas mixtures in which the oxygen concentration by volume exceeds 23.5% at sea level or whose partial pressure of oxygen exceeds 175 torr (mm Hg) [3].

3.2.2 Pressure
Bar shall indicate gauge pressure unless otherwise noted, i.e., bar, abs for absolute pressure and bar, dif for differential pressure.

4 General properties

Oxygen, which is essential to life, is not flammable in itself, but supports and accelerates combustion. The normal oxygen concentration in atmospheric air is approximately 21% by volume.

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