CGA®

Compressed Gas Association

The Standard For Safety Since 1913

# CGA P-58—2022

## SAFE PREPARATION OF COMPRESSED OXIDANT-FUEL GAS MIXTURES IN CYLINDERS

THIRD EDITION

## PREFACE:

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has issued CGA P-58, *Safe Preparation of Compressed Oxidant-Fuel Gas Mixtures in Cylinders*, jointly produced by members of the International Harmonization Council and originally published by the European Industrial Gases Association (EIGA) as EIGA Doc 139, *Safe Preparation of Compressed Oxidant-Fuel Gas Mixtures in Cylinders*.

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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NOTE—Technical changes from the previous edition are underlined.

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

NOTE—Appendix D (Normative) is a requirement.

THIRD EDITION: 2022
SECOND EDITION: 2015
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**Contents** **Page**

# 1 Introduction

Cylinders containing both oxidant and flammable components (oxidant-fuel gas mixtures) are widely used in industry, medical applications, and other fields. Typical applications include calibration of flammable gas detectors, emission monitoring equipment, and refinery process analyzers.

Due to the inherent nature of the gases used to manufacture oxidant-fuel gas mixtures, there is always the possibility of an explosive mixture being produced. To prevent the inadvertent production of explosive mixtures, strict rules and procedures shall be followed during the formulation and manufacturing processes.

Historically, during the manufacture and use of these gas mixtures, industry has experienced accidents and losses resulting in explosions that have caused injuries and death. These incidents have been caused by mixtures being manufactured that have been within the explosive range.

Compressed oxidant-fuel gas mixtures can be manufactured safely provided the principles contained in this publication are followed.

# 2 Scope and purpose

## 2.1 Scope

This publication documents the minimum requirements for the safe preparation of compressed oxidant-fuel gas mixtures in cylinders by static methods (addition of one component after another in cylinders). The publication specifically addresses:

- key principles for compressed oxidant-fuel gas mixture manufacture;
- manufacturing feasibility studies;
- gas mixing equipment, filling, and analysis; and
- the audit of oxidant-fuel gas mixture manufacturing procedures and operations.

This publication specifically describes the manufacture of compressed oxidant-fuel gas mixtures under the conditions of gas temperatures and pressures detailed within this publication. The manufacture of liquefied and liquid oxidant-fuel gas mixtures is outside of the scope of this publication.

This publication shall be used in conjunction with the information and principles contained in CGA P-36, *The Safe Preparation of Gas Mixtures* [1].[1]

## 2.2 Purpose

The purpose of the publication is to describe practices to be used for the safe preparation of compressed oxidant-fuel gas mixtures and to ensure that they are non-explosive at the end of the manufacture.

- Safe formulation of compressed oxidant-fuel gas mixture by trained and competent personnel;
- Defined safety considerations, which are applied and maintained during the manufacturing process; and
- Overall quality system with formally approved documented procedures shall be used for manufacture and these procedures and practices shall be subject to the regular technical review and audit by technical experts independent of the routine production process.

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