

**CGA P-2.5–2011**

**TRANSFILLING OF  
HIGH PRESSURE  
GASEOUS OXYGEN  
USED FOR  
RESPIRATION**

**SIXTH EDITION**



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Work Item 10-069  
Medical Gases and Equipment Committee

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NOTE—Technical changes from the previous edition are underlined.

SIXTH EDITION: 2011  
FIFTH EDITION: 2007  
REAFFIRMED: 2005  
FOURTH EDITION: 2000

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## 1 Introduction

This publication is provided as a service by the Compressed Gas Association (CGA) for persons and organizations who transfill gaseous oxygen to be used for respiration. It is not a procedures guide for transfilling; rather, it points out the safety concerns, regulatory compliance requirements, and potential hazards of transfilling. This publication is not to be considered an approval of this potentially hazardous activity. Cylinders should be filled only by trained and qualified personnel using components and equipment as set forth in this publication. Transfilling should be performed only in facilities where effective controls and safety procedures have been established and are well understood and enforced.

**CAUTION:** *Transfilling attempted by unskilled, untrained persons (such as might be encountered in a private home environment) constitutes an extremely hazardous operation and is not condoned.*

Oxygen to be used for medical purposes is a prescription drug when used for therapeutic purposes and shall be prescribed by a physician. However, current practice permits medical oxygen for emergency use to be distributed without a prescription providing the users are properly trained in the administration of emergency oxygen. Its packaging requires specifically prescribed tests and compliance activity record keeping.

In the United States, the regulations of the Food and Drug Administration (FDA), Department of Transportation (DOT), and the Occupational Safety and Health Administration (OSHA) apply. In Canada, requirements of Transport Canada (TC), *Transportation of Dangerous Goods Act and Regulations*; Canadian Standards Association (CSA); Health Canada, Therapeutic Products Programme; and other government agencies and publications also apply. The National Fire Protection Association's publication NFPA 99, *Standard for Health Care Facilities*, contains restrictions for transfilling in medical facilities [1].<sup>1</sup>

## 2 Scope

This publication describes the primary hazards involved in the transfilling of high pressure gaseous oxygen for respiratory use and advises that before engaging in this practice, it is essential to be familiar with the hazardous properties of oxygen, required safety precautions, and the applicable government regulations. This publication also describes minimum requirements for equipment that is used in transfilling.

## 3 Hazards of transfilling

Transfilling of gaseous oxygen from one or more cylinders to other cylinders involves hazards associated with the handling of gas under high pressure, the possibility that the repackaged oxygen may have become contaminated, and the oxidizing property of oxygen, which supports vigorous combustion.

This publication applies to cylinders fitted with connection CGA 540, CGA 870, or the manufacturer's own proprietary connection being transfilled from cylinders having pressures not exceeding 3000 psig at 120 °F (20 680 kPa at 48.9 °C).<sup>2</sup>

Cylinders for oxygen are also available with different connections (CGA 577 for cylinders of 3001 psig to 4000 psig at 120 °F (20 690 kPa to 27 580 kPa at 48.9 °C), and CGA 701 for cylinders of 4001 psig to 5500 psig at 120 °F (27 590 kPa to 37 900 kPa at 48.9 °C). Transfilling from these high pressure cylinders is considered extremely hazardous even by qualified personnel and should not be attempted. These pressures are at or near the rupture pressure of most small cylinders fitted with connection CGA 540 or CGA 870.

If, with full knowledge of the associated potential hazards, transfilling is attempted from cylinders with pressures in the ranges of 3001 psig to 4000 psig (20 690 kPa to 27 580 kPa) or 4001 psig to 5500 psig (27 590 kPa to 37 900 kPa), a suitable regulator and pressure relief devices shall be used.

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<sup>1</sup> References are shown by bracketed numbers and are listed in order of appearance in the reference section.

<sup>2</sup> 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, *Metric Practice Guide for the Compressed Gas Industry* [2].