

**CGA M-3—2009**

**GUIDE FOR THE  
MANUFACTURER OF  
BULK MEDICAL GASES**

**THIRD EDITION**



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## 1 Introduction

This publication is a guide for compliance with the applicable regulations of the U.S. Food and Drug Administration (FDA) for the manufacture of bulk medical gases classified as drugs as described in Title 21 of the U.S. *Code of Federal Regulations* (21 CFR) [1].<sup>1</sup> It outlines the requirements for manufacturing bulk medical gases classified as drugs; however, it may not contain all information necessary to comply with FDA regulations. It is the responsibility of each gas manufacturer to ensure that their standard operating procedures (SOP) comply with all applicable federal, state, and local regulations.

## 2 Scope

This publication applies to the bulk manufacturing of medical gases as follows:

- bulk air separation (oxygen, USP and nitrogen, NF) manufacturing and distribution facilities;
- bulk carbon dioxide, USP manufacturing and distribution facilities;
- bulk helium, USP manufacturing and distribution facilities; and
- bulk nitrous oxide, USP manufacturing and distribution facilities.

See the *United States Pharmacopeia and National Formulary (USP–NF)* for information on the USP and NF designations for medical gases [2].

## 3 Definitions

For the purpose of this publication, the following definitions apply.

### 3.1 Adulterated

Condition in which a drug product actually or potentially does not meet all required or claimed standards of purity, strength, identity, or quality, or contains a foreign substance that can be injurious to health.

NOTE—A drug product not manufactured in accordance with current good manufacturing practice (CGMP) may be considered adulterated. See Section 501 of the Federal *Food, Drug, and Cosmetic Act* [3].

### 3.2 Agency

United States Food and Drug Administration (FDA).

### 3.3 Air liquefaction

Process by which air is separated into its component parts by cryogenic distillation.

### 3.4 Air separation unit (ASU)

Facility that manufactures bulk liquid oxygen, nitrogen, and/or argon by the air liquefaction process.

### 3.5 Alternate test method

Analytical method using a technology or method of operation that is different from but equivalent to the method that appears in the official *USP–NF* monograph [2].

### 3.6 Assay

Analytical test used to determine the strength of the component of interest (for example, percent oxygen).

### 3.7 Automated analysis

Systems in the bulk medical gas filling process that provide for automatic sampling and analysis of a product along with automatic recording and/or storage of required quality control data.

NOTE—An automated analysis system may be considered an electronic record keeping system under 21 CFR Part 11 [1]. It may or may not contain provisions for electronic signatures

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