



**CGA M-14—2022
GUIDELINE FOR LIQUID OXYGEN
AND LIQUID NITROGEN
BULK TRANSPORT
CHANGE OF GRADE**

THIRD EDITION

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NOTE—Technical changes from the previous edition are underlined.

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1 Introduction

This publication describes the compressed gas industry's standard operating procedures (SOP) for changing the grade of liquid oxygen and liquid nitrogen bulk transports from nonmedical service to medical service. The change of grade procedure meets current good manufacturing practice (CGMP) requirements and ensures that containers are suitable to receive medical grade product.

2 Scope

This publication contains the minimum criteria for changing the grade of liquid oxygen and liquid nitrogen bulk transports from nonmedical to medical service. This includes converting bulk transports from:

- nonmedical oxygen to oxygen, USP; and
- nonmedical nitrogen to nitrogen, NF.

This publication does not apply to bulk transports that undergo a change of service from one product to another product such as oxygen to nitrogen, nitrogen to oxygen, etc.

This publication does not apply to nitrous oxide or carbon dioxide change of grade.

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 Bulk transport

Single vessel that typically contains greater than 500 gal of a refrigerated liquid (cryogenic or noncryogenic) and is permanently mounted to a trailer, ISO frame, truck (including a microbulk truck), or rail car.

3.2.2 Change of grade

Converting a bulk transport that previously contained one grade of product to another grade of the same product, for example, nonmedical oxygen to medical oxygen, USP.

3.2.3 Change of service

Converting a bulk transport that previously contained one product to a different product, for example, oxygen to nitrogen.