

CGA C-8.3—2019

**SAFE PRACTICES FOR
STORAGE AND HANDLING
OF NITROUS OXIDE**

THIRD EDITION

CGA

Compressed Gas Association

The Standard For Safety Since 1913

PREFACE

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has issued CGA G-8.3, *Safe Practices for Storage and Handling of Nitrous Oxide*, jointly produced by members of the International Harmonization Council and originally published by the European Industrial Gases Association (EIGA) as EIGA Doc 176, *Safe Practices for Storage and Handling of Nitrous Oxide*.

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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Work Item 20-007

Bulk Distribution Equipment and Standards Committee

NOTE—Technical changes from the previous edition are underlined.

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Contents

1	Introduction.....	1
2	Scope	1
3	Definitions.....	1
4	Properties and hazards	3
4.1	Physical properties and hazards	4
4.2	Chemical properties and hazards.....	6
4.3	Occupational exposure.....	10
4.4	Environmental issues	11
4.5	Security.....	11
5	Equipment and procedures	12
5.1	Principles	12
5.2	Compatibility of materials with nitrous oxide.....	12
5.3	Valves.....	13
5.4	Filters.....	13
5.5	Cleaning of installation	13
5.6	Prevention of contamination.....	14
5.7	Avoiding high temperatures.....	14
5.8	Restriction of flow velocity	15
5.9	Operating procedures.....	15
5.10	Maintenance procedures.....	15
5.11	Isolation from flammable gases.....	15
5.12	Use of carbon dioxide equipment.....	16
6	Stationary tanks.....	16
6.1	Design	16
6.2	Refrigeration units	17
6.3	Vaporizers and heaters	18
6.4	Piping, instrumentation, and valves.....	18
6.5	Pressure relief valves	19
6.6	Filling degree or filling ratio.....	20
6.7	Filling of stationary low pressure tanks.....	20
6.8	Product return.....	20
7	Supply equipment.....	21
7.1	Cylinders.....	21
7.2	Bundles.....	21
7.3	Transport tanks.....	21
7.4	Pumps	23
7.5	Hoses, accessories, and couplings (fill connections)	24
8	Product transfer	25
8.1	Cylinders and bundles.....	25
8.2	Transport tanks.....	26
9	Emergency response	27
9.1	Hazards	27
9.2	Procedures for large leaks or spills of nitrous oxide.....	27
9.3	Procedures at fire situations.....	27
9.4	Procedures at a traffic incident involving a transport tank	28
9.5	Personal protective equipment.....	29
9.6	First aid.....	30
10	References	30

Tables

Table 1—Identification of nitrous oxide	3
Table 2—Properties of nitrous oxide	4
Table 3—Properties of saturated liquid nitrous oxide	4
Table 4—Nitrous oxide	6
Table 5—Explosion limits for some typical flammable gases with nitrous oxide at atmospheric conditions ...	7
Table 6—Extract from Packing Instruction P200	26

Figures

Figure 1—Propagation threshold for nitrous oxide	9
Figure 2—P&I diagram of a typical nitrous oxide vacuum-insulated stationary tank	11
Figure 3—Safe filling volumes for 319 psi (22 bar) nitrous oxide storage tanks	27

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1 Introduction

Nitrous oxide (N₂O) has been produced and distributed by the industrial gases industry for many years. It is mainly used for medical purposes (anesthesia), food packaging, and electronic industries.

Incidents such as violent decomposition of nitrous oxide and the rupture of nitrous oxide tanks have occurred at production, storage, and distribution facilities. In addition, nitrous oxide gas, in elevated concentrations, can cause health effects in personnel, which shall be prevented.

This publication describes the properties and hazards of nitrous oxide. On this basis, the principles and relevant details of safe storage and distribution of nitrous oxide are considered. Most severe incidents have been caused by insufficient understanding of the properties of nitrous oxide.

Regulatory requirements for medical applications shall also be followed.

2 Scope

This publication addresses the safe use in the industrial and medical gases industry for the design, engineering, construction, and operation of nitrous oxide, storage, and supply installations. The design and installation requirements and recommendations included in this publication apply only to installations begun after the publication date. Some design and installation requirements shall be considered for existing installations where specified in this publication. These requirements shall be completed within 2 years of publication of this standard.

Operational requirements and recommendations should be considered for existing installations. This publication does not cover the manufacturing of nitrous oxide or quality control and analysis procedures. Refer to CGA G-8.4, *Safe Practices for the Production of Nitrous Oxide from Ammonium Nitrate* [1].¹

3 Definitions

For the purposes 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

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 Authorized person

Trained and qualified person approved or assigned to perform specific types of duties or to be at a specific location.

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