

CGA P-8.8—2012

**SAFE DESIGN AND
OPERATION OF
CRYOGENIC ENCLOSURES**

FIRST EDITION



**COMPRESSED GAS
ASSOCIATION, INC.**

PREFACE

As part of a program of harmonization of industry standards, the European Industrial Gases Association (EIGA) and the Compressed Gas Association (CGA) formed a Joint Working Group (JWG) to produce P-8.8—2012, *Safe Design and Operation of Cryogenic Enclosures*. This standard is intended as an international harmonized standard for the worldwide use and application of all members of the Asia Industrial Gases Association (AIGA), EIGA, Japan Industrial and Medical Gases Association (JIMGA) and CGA worldwide. The CGA edition is identical in technical content to the EIGA edition except for regional regulatory requirements (noted), and it has minor changes in formatting and spelling.

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A listing of all publications, audiovisual programs, safety and technical bulletins, and safety posters is available via the Internet at our website at www.cganet.com. For more information contact CGA at Phone: 703-788-2700, ext. 799. E-mail: customerservice@cganet.com.

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1 Introduction

This publication has been prepared by member associations of the International Harmonization Council, under the lead of the European Industrial Gases Association (EIGA) and is intended for the worldwide use and application by all members of the International Harmonization Council. Regional editions may use non SI units and refer to national, and or regional legislation.

Cryogenic processes often operate inside enclosures that insulate the process equipment and interconnecting piping from ambient air and temperature. This prevents many problems, including excessive heat leak into the process and water freezing around the equipment. In many cases, the enclosure is purged with a dry gas to prevent ambient air from entering the enclosure and creating hazardous mixtures.

2 Scope and purpose

Cryogenic enclosures can create potential process safety hazards. This publication identifies the general hazards, and provides guidance to reduce their frequency and consequences. It provides safety guidance and addresses design and operating practices only as they affect safety.

This publication addresses both cryogenic air separation unit (ASU) and HYCO processes. A number of existing publications cover special requirements of these processes and their equipment [1, 2, 3, 4, and 5].

This publication does not cover the following:

- Design and operating practices that only improve efficiency or cost;
- Generally accepted engineering practice for structures and process equipment; only those issues that are specific to cryogenic enclosures are included;
- Consequence analysis of the potential safety hazards; or
- Enclosures for processes producing liquid hydrogen or helium. The extreme cold temperatures of these processes require specialized knowledge and practices, which are beyond the scope of this publication.

This publication is primarily to document current practices and is intended to apply to new facilities. It is recognized that some existing plants may not meet all recommendations or requirements from this publication. This publication need not be applied retroactively, including where this publication uses the word “shall”.

3 Definitions

3.1 Verbal Forms

Within this publication, the following definitions are used:

- Shall indicates that the procedure is mandatory. It is used wherever criterion for conformance to specific recommendation allows no deviation.
- Should indicates that a procedure is recommended.
- May and Need Not indicate that the procedure is optional.
- Will is used only to indicate the future, not a degree of requirement.
- Can indicates a possibility or ability.

3.2 Air separation unit (ASU)

Separates air into its components. In this publication, an ASU is assumed to operate at cryogenic temperatures.