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FLUORINE AND FLUORINE MIXTURES WITH INERT GASES

FIRST EDITION

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PREFACE

As a part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has adopted the original European Industrial Gases Association (EIGA) Document 140/10, *Code of Practice Compressed Fluorine and Mixtures with Inert Gases.* This publication is an internationally harmonized standard for the worldwide use and application by all members of the Asia Industrial Gases Association (AIGA), CGA, EIGA and the Japan Industrial and Medical Gases Association (JIMGA). The CGA edition, G-15—2010 , has the same technical content as the EIGA edition. However, there are editorial changes primarily in formatting and spelling and references to regional regulatory requirements.

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1 Introduction

Fluorine is a highly toxic and oxidizing gas which presents safety risks, such as poisoning by inhalation of the gas, or by ignition of the handling equipment.

The risks involved with fluorine compression and handling can be minimized to an acceptable level, if equipment is properly designed and if appropriate handling precautions are taken, as described in this publication.

The content of this publication has been prepared by the European Industrial Gases Association (EIGA) with manufacturers of fluorine and the German Federal Materials Testing Institute (BAM).

The information that is contained in this publication is based mainly on the experience in compressing and handling fluorine within the companies who prepared it and on published literature.

2 Scope and purpose

This publication is for gaseous fluorine and mixtures of fluorine with inert gases where the resulting fluorine concentrations of equal to and greater than 0.5% fluorine are considered to present a risk of reaction due to the oxidizing potential.

It is intended for the suppliers, distributors, and users of fluorine and fluorine mixtures and the associated handling equipment.

It sets out to provide a good understanding of the potential hazards involved in storage, use and transportation of compressed fluorine and its mixtures with inert gases and the approach to be taken to minimize the risk of incidents.

This publication does not cover the manufacture, purification, liquefaction, or analysis of fluorine or its mixtures with inert gases, although the general guidance given is also relevant to these processes.

Within Appendix 2 of this publication is an audit checklist.

3 Definitions

3.1 Autoignition temperature
The temperature at which a substance will spontaneously ignite in a specified oxidant at a given pressure.

3.2 Bundle (of cylinders)
Assembly of cylinders that are fastened together and which are interconnected by a manifold and carried as a unit.

3.3 Cylinder
A cylinder is defined as a transportable container of up to 150 L water capacity that can be filled with gas under pressure.

3.4 Cylinder recovery vessel
Commonly known in the gas industry as “containment vessel”. A pressure vessel which is designed to safely contain a cylinder and its content for transportation and storage until it can be safely emptied. A cylinder recovery vessel is often fitted with a gauge to indicate internal pressure and with valves to enable purging.

NOTE—Due to the strong oxidizing potential of fluorine the use of a containment vessel for pure fluorine or high concentrations of mixtures may not be appropriate. See Section 11 for details.

3.5 EEL
Emergency Exposure Level.

3.6 F_2
Chemical formula for fluorine.