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NATIONAL STANDARD

# ANSI/CAN/UL/ULC 407:2022

# STANDARD FOR SAFETY

## Manifolds for Compressed Gases

Approved American National Standard

ANSI/UL 407-2022

## SCC FOREWORD

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UL Standard for Safety for Manifolds for Compressed Gases, ANSI/CAN/UL/ULC 407

Eighth Edition, Dated December 14, 2022

***Summary of Topics***

***This new edition of ANSI/CAN/UL/ULC 407 dated December 14, 2022 merges relevant content from ULC/ORD-C407 with ANSI/UL 407 to create a single, joint standard applicable in both the USA and Canada.***

The new requirements are substantially in accordance with Proposal(s) on this subject dated March 18, 2022 and July 1, 2022.

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ANSI/UL 407-2022

DECEMBER 14, 2022



# ANSI/CAN/UL/ULC 407:2022

## Standard for Manifolds for Compressed Gases

The first, second and third editions were titled High-Pressure Gas Manifolds.

First Edition – December, 1952
Second Edition – October, 1967
Third Edition – October, 1972
Fourth Edition – April, 1978
Fifth Edition – July, 1993
Sixth Edition – October, 1997
Seventh Edition – June, 2004

**Eighth Edition**

**December 14, 2022**

This ANSI/CAN/UL/ULC Safety Standard consists of the Eighth Edition.

The most recent designation of ANSI/UL 407 as an American National Standard (ANSI) occurred on December 14, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on December 14, 2022.

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# Preface

This is the Eighth Edition of ANSI/CAN/UL/ULC 407, Standard for Manifolds for Compressed Gases.

UL is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO). ULC Standards is accredited by the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL/ULC 407 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Comments or proposals for revisions on any part of the Standard may be submitted at any time. Proposals should be submitted via a Proposal Request in the On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Compressed Gas Regulators and Accessories, STP 252.

This list represents the STP 252 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

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|---|---|---|---|
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This Standard is intended to be used for conformity assessment.

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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## INTRODUCTION

### 1 Scope

1.1 These minimum requirements cover equipment for manifolding high-pressure gas cylinders to supply gas for various industrial and commercial applications. Cylinders are manifolded for the purpose of centralizing the gas supply, to provide a continuous supply of gas, or to provide gas at a rate in excess of that which may be obtained from a single cylinder.

1.2 The requirements apply to manifolds for the following gases:

a) Acetylene;

b) Oxygen;

c) Fuel gases other than acetylene;

d) Nitrogen, carbon dioxide, air, and inert gases; and

e) Nonflammable medical gases.

1.3 Manifolds covered by this Standard are intended to be installed and used in accordance with the applicable Codes and Regulations as determined by the Authority Having Jurisdiction (AHJ), such as, but not limited to:

a) In the United States:

1) For manifolds other than for nonflammable medical gas, the Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes, NFPA 51;

2) For LP-Gas manifolds, the Liquefied Petroleum Gas Code, NFPA 58;

3) For nonflammable medical gas manifolds, the Standard for Healthcare Facilities, NFPA 99.

b) In Canada:

1) The Natural gas and propane storage and installation code, CSA B149 Series; and

2) Provincial or other Regulations.

NOTE: For the purposes of this standard the terms “LP-Gas” and “Propane” are interchangeable.

### 2 General

#### 2.1 Components

2.1.1 Except as indicated in 2.1.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.1.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

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2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.1.5 A component, as assembled as part of a manifold, shall comply with the requirements for the construction, performance, and use for that component.

### 2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

### 2.3 Reference publications

2.3.1 The documents shown below are referenced in the text of this Standard. Any undated reference to a code or standard appearing in the requirements of this Standard shall be interpreted as referring to the latest edition of that code or standard.

UL 21, *LP-Gas Hose*

UL 508A *Industrial Control Panels*

UL 569, *Pigtails and Flexible Hose Connectors for LP-Gas*

UL 1331, *Station Inlets and Outlets*

UL 1357, *Outline of Investigation for Oxygen-Fuel Gas Combination Flash Arrester and Backpressure Check Valves*

UL 1477, *Outline of Investigation for Compressed Gas Shutoff Valves*

UL 2061, *Adapters and Cylinder Connection Devices for Portable LP-Gas Cylinder Assemblies*

ANSI/CAN/UL/ULC 125, *Standard for Flow Control Valves for Anhydrous Ammonia and LP-Gas*

ANSI/CAN/UL 144, *LP-Gas Regulators*

ANSI/CAN/UL/ULC 252, *Compressed Gas Regulators*

ANSI/CAN/UL/ULC 252A, *Compressed Gas Regulator Accessories*

ANSI/CAN/UL/ULC 404, *Gauges, Indicating Pressure, for Compressed Gas Service*

AIAA G-095A, *Guide to Safety of Hydrogen and Hydrogen Systems*

ASME B31.12 *Hydrogen Piping and Pipelines*

ASTM B858, *Standard Test Method for Ammonia Vapor Test for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys*

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ASTM D471, *Standard Test Method for Rubber Property – Effect of Liquids*

ASTM F1459, *Standard Test Method for Determination of the Susceptibility of Metallic Materials to Hydrogen Gas Embrittlement (HGE)*

ASTM G142, *Standard Test Method for Determination of Susceptibility of Metals to Embrittlement in Hydrogen Containing Environments at High Pressure, High Temperature, or both*

CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections*

CSA/AM ANSI/CSA CHMC 1, *Test methods for evaluating material compatibility in compressed hydrogen applications – Metals*

CSA/AM CSA/ANSI CHMC 2:19, *Test methods for evaluating material compatibility in compressed hydrogen applications – Polymers*

CSA 8.1, *Standard for Elastomeric composite hose and hose couplings for conducting propane and natural gas*

CSA 8.3, *Standard for Thermoplastic hose and hose couplings for conducting propane and natural gas*

CSA B149 Series

CSA C22.2 No. 0.14, *Industrial Control Equipment*

CSA C22.2 No. 0.15, *Adhesive Labels*

CSA-C22 No. 286, *Industrial Control Panels And Assemblies*

CAN/CSA-Z305.5, *Medical Gas Terminal Units*

CAN/CSA-Z5359, *Anaesthetic and Respiratory Equipment – Low-Pressure Hose Assemblies for Use with Medical Gases, Medical Vacuum, Medical Support Gases, and Anaesthetic Gas Scavenging Systems*

CAN/CSA-Z9170-1, *Terminal Units for Medical Gas Pipeline Systems – Part 1: Terminal Units for Use with Compressed Medical Gases, Vacuum, and Anaesthetic Gas Scavenging Systems*

ISO 5175-1, *Gas welding equipment – Safety devices – Part 1: Devices incorporating a flame (flashback) arrestor*

ISO TR 15916, *Basic considerations for the safety of hydrogen systems*

NFPA 51, *Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes*

NFPA 58, *Liquefied Petroleum Gas Code*

NFPA 99, *Standard for Healthcare Facilities*

NFC, *National Fire Code of Canada*

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