



**Medical gas pipeline systems — Part 1: Pipelines
for medical gases, medical vacuum, medical
support gases, and anaesthetic gas scavenging
systems**



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C. Stark	London Health Sciences Centre, London, Ontario, Canada <i>Category: User Management</i>	<i>Chair</i>
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S. Hiremath	University of Ottawa and Ottawa Hospital, Ottawa, Ontario, Canada	

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L. Ladouceur	McMaster University, Ottawa, Ontario, Canada	<i>Non-voting</i>
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F. Qureshi	Air Liquide Healthcare / GH Medical, Brampton, Ontario, Canada	<i>Non-voting</i>
K. Ratnayake	Burlington, Ontario, Canada	<i>Non-voting</i>
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J. Smith	Alberta Health Services, Calgary, Alberta, Canada <i>Category: User Management</i>	
C. Williams	Canadian Patient Safety Institute, Mount Pearl, Newfoundland and Labrador, Canada	<i>Non-voting</i>
T. Qasim	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

Subcommittee on Medical Gas Systems

G. D. Burrill	Teegor Consulting Inc., Fredericton, New Brunswick, Canada	<i>Chair</i>
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C. B. Doerksen	Shared Health Health Sciences Centre, Winnipeg, Manitoba, Canada	
Duff	ON2 Solutions, Morden, Manitoba, Canada	
R. Early	Compressed Gas Association, Inc., Chantilly, Virginia, USA	
G. Edwards	Praxair Canada Inc., Mississauga, Ontario, Canada	
P. Edwards	Air Liquide Healthcare, Mississauga, Ontario, Canada	
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B. Hunt	Prescientx, Cambridge, Ontario, Canada	

K. Monteiro	Smith + Andersen, Toronto, Ontario, Canada	
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C. Over	Class 1 Inc., Cambridge, Ontario, Canada	
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A. Pinkerton	PMG Systems Ltd., East York, Ontario, Canada	
F. Qureshi	Air Liquide Healthcare / GH Medical, Brampton, Ontario, Canada	
J. Smith	MCW Hemisphere Ltd., Edmonton, Alberta, Canada	
M. Stewart	DMS Medical Gas Systems Inc., Breslau, Ontario, Canada	
M. St-Georges	Régie du bâtiment du Québec, Montréal, Québec, Canada	
T. Qasim	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

Preface


This is the fifth edition of CSA Z7396.1, *Medical gas pipeline systems — Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems*. It supersedes the previous editions published in 2017, 2012, 2009, and 2006. It is comparable in scope to ISO 7396-1, *Medical gas pipeline systems — Part 1: Pipeline systems for compressed medical gases and vacuum* and ISO 7396-2, *Medical gas pipeline systems — Part 2: Anaesthetic gas scavenging disposal systems*, but contains requirements to reflect Canadian practices and safety considerations.

This Standard is primarily intended to address new installations and does not require the retrofitting of existing systems. Clause [11.5](#) covers repairs, additions, and modifications to existing pipeline systems. For existing systems, the Subcommittee recommends that health care facilities document and survey their installations to determine the adequacy of the pipeline distribution system and to properly identify components requiring emergency repairs or maintenance.

This edition of CSA Z7396.1 includes comprehensive requirements and guidance for safety in medical gas pipeline systems. This edition sees expansion in requirements and guidance on

- a) maintenance, with a new sample form Figure [J.1](#) used for an audit or verification of a compliance with Clause [15](#);
- b) a new requirement for an emergency management program (Clause [4.11](#));
- c) medical supply unit concealed hoses compliance inspections;
- d) product quality updates (all gases);
- e) system design configurations with new and updated figures;
- f) enclosures including compounds and safety related updates;
- g) new technologies allowed for fitting and materials;
- h) AGSS safety and operation;
- i) commission and inspection body checklists;
- j) alarm tables format;
- k) importance of professional training and education;
- l) oxygen concentrators;
- m) alarms and monitoring;
- n) on-going verification; and
- o) new definitions.

Also included are expanded informative, non-mandatory annexes for medical gas pipe sizing, pipeline installation test reporting, emergency preparedness and response, emergency procedures, alternate solutions, environmental, fire control, and plume evacuation systems. As well, the informative commentary on key clauses has been enhanced.

Explanatory material has been added to clarify the content of this Standard. A symbol () beside a clause number identifies a clause for which further information is provided in Annex [A](#).

CSA Group acknowledges that the development of the fourth edition of this Standard was made possible, in part, by the financial support of the governments of Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Québec, Saskatchewan, and Yukon as administered by the Canadian Agency for Drugs and Technologies in Health (CADTH).

This Standard was prepared by the Subcommittee on Medical Gas Systems, under the jurisdiction of the Technical Committee on Perioperative Safety and the Strategic Steering Committee on Health Care Technology, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

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CSA Z7396.1:22

Medical gas pipeline systems — Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems

1 Scope

1.1 General

This Standard specifies safety requirements for pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems in health care facilities, both public and private. It applies to all facilities providing health care services, regardless of type, size, location, or range of services, including, but not limited to

- a) acute care hospitals;
- b) in-patient continuing care hospitals;
- c) long-term care facilities;
- d) community-based providers;
- e) leased/rental suites in office buildings; and
- f) ambulatory and outpatient care clinics (e.g., day surgery, endoscopy clinics, dentists' offices, and doctors' offices).

1.2 Intended use

C [There is a commentary available for this Clause.](#)

This Standard is intended for use by anyone involved in the design, installation, commissioning and testing, documentation, operation, and maintenance of pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems. The requirements cover

- a) the design of systems to ensure the continuous supply of gas or vacuum in normal condition or in single fault condition;
- b) the selection of materials and components;
- c) the non-interchangeability of equipment between different gas systems and services;
- d) the cleanliness of materials and components and of the completed system;
- e) installation procedures for supply systems and pipelines;
- f) the configuration of system components;
- g) control, monitoring, and alarm systems;
- h) the markings and information to be supplied by the manufacturer or installer;
- i) contaminant testing of pipelines;
- j) the final testing of each medical gas pipeline prior to its use in patient care to ensure that it contains only the specified gas; and
- k) maintenance and ongoing verification.