

Australian Standard®

**Medical gas systems—Installation
and testing of non-flammable
medical gas pipeline systems**

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Australian Society of Anaesthetists
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PREFACE

This Standard was prepared by the Standards Australia Committee on Medical Gases and Pipeline Services to supersede AS 2896—1986.

This Standard differs from the 1986 edition in that guidelines for fixed secondary equipment such as pendants and columns are now included, Appendix A has been modified, Figures 1.1, 1.2 and 1.3 have been amended, Table 4.1 has been altered and the use of UPVC pipes for vacuum has been excluded.

In medical establishments it is vital that high safety standards are maintained and also that there is no risk of failure of supply or plant without adequate warning. Thus particular attention is given in this Standard to the following:

- (a) Design of equipment to ensure non-interchangeability between services.
- (b) Use of correct materials, and cleanness of materials.
- (c) Reserve supplies of gas and reserve plant.
- (d) Warning systems for gas failure.
- (e) Testing and commissioning of pipelines, in particular to detect cross-connections.
- (f) Identification of pipelines.

Requirements in this Standard may be used as a guide for piping systems for other non-flammable medical gases and anaesthetic gas scavenging systems but variations in the requirements may be necessary. This Standard will be revised should such a gas come into general use.

Non-flammable medical gas pipeline systems are installed according to all national and local codes and regulations such as building, electrical and safety codes. It should be noted that for installation of a pipeline, a high quality of workmanship and experience is essential. For certain situations, e.g. hyperbaric conditions, special design and performance criteria for pipelines may be required.

Requirements for suction systems are included in this Standard. At this time there are two techniques widely used, namely pipeline vacuum and venturi ejector suction. Each has its particular advantages. This Standard and AS 2120 specify performance and safety aspects to which both should conform. Requirements for a reasonable reserve performance are incorporated in relevant sections of this Standard; further allowances should not be necessary, unless it is intended to extend the pipeline in question in the future. With regard to anaesthetic gas scavenging, currently available evidence suggests that there is no special hazard associated with venting of waste anaesthetic gases into a central suction system.

Many systems in use do not comply with the intent of Clause 3.5 on terminal units. Because the gas specific component of some terminal units can be removed, these units can become a hazard to patients. To obviate this risk it is recommended that panels with multiple terminal outlets be upgraded within 12 months of publication of this Standard, to the intent of Clause 3.5. It is recognized that replacement of single terminal outlet panels is less urgent because of the smaller risk.

A sleeve indexed fitting is given in Figure 3.3 for surgical tool gas. This connection is recommended as it contains a thread, and therefore by its design has a controlled detachment and reduces the risk of 'hose whip'. The use of adaptors with 'quick connect/disconnect' (Schrader) fittings is not advisable.

In the preparation of this Standard, cognizance was taken of ISO 7396—1987, *Non-flammable medical gas pipeline systems*.

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FOREWORD

Gas pipeline systems have some characteristic hazards, usually related to their original construction, modification, or repair rather than to problems arising during their working life. Hazards include plumbing errors; use of materials incompatible with the gases to be delivered; obstruction of flow by material left in the pipelines; gas contamination by residual debris or accumulated foreign matter such as scale and organic contamination; and gas contamination due to chemical interaction between the gases and the pipeline components or foreign matter and condensation in pipelines. A particularly hazardous situation can occur when even small amounts of grease or oil come in contact with oxygen.

For this reason, this Standard requires that the following procedures be taken to avoid gas pipeline hazards:

- (a) Documentation of tests and results from those responsible for the construction shall be provided to the health care facility, and these shall form a permanent record.
- (b) Independent inspection of the system by *the health care facility*, using its own qualified personnel, or an experienced agent which may be an independent outside contractor, to confirm and document the system's satisfactory operation.

The maintenance and servicing of the gas pipeline system is the responsibility of the health care facility but may be delegated.

Components of the medical gas system should be obtained and installed under the supervision of a person familiar with proper practices for their construction, installation and use. Construction and installation of central supply systems require great care and shall only be undertaken by experienced personnel. In order to establish this, the hospital authority should examine closely the previous experience of any constructor or installer proposing to work on or build a pipeline system. The authority should also determine if the constructor or installer is familiar with the contents of this Standard, which should be specified in the construction agreement.

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