AS 1169—1982

Australian Standard®

Minimizing of combustion hazards arising from medical use of flammable anaesthetic agents

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The following interests were represented on the committee responsible for the preparation of this standard:

Association of Consulting Engineers Australia

Australian Society of Anaesthetists

Confederation of Australian Industry

Department of Health

Department of Housing and Construction

Department of Public Works, New South Wales

Department of Public Works, Western Australia

Electricity Trust of South Australia

Health Commission of New South Wales

Hospital architects

Institute of Hospital Engineers

Metal Trades Industry Association of Australia

Public Buildings Department, South Australia

Royal Australasian College of Surgeons

South Australian Health Commission

State Electricity Commission of Victoria

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PREFACE

This edition of this standard was prepared by the Association's Committee on Medical Gases and Pipeline Services under the direction of the Medical Materials and Equipment Standards Committee. It supersedes Part 1 of AS 1169–1973, but does not supersede part 2 of AS 1169–1973. Part 2, which at present applies to the installation and testing of medical gas supply systems, is under revision and will be re–issued with a different Australian standard number.

This edition takes account of changes in medical practice that have occurred since publication of the previous edition, particularly the frequent and widespread use of surgical diathermy and the increasing use of electromedical equipment for monitoring patients. In addition, the committee recognized that in the majority of operating theatres, in most medical rooms in industrial premises, in dental surgeries and the like, flammable anaesthetic agents are no longer used. The use of non–flammable agents for anaesthesia eliminates the need for extensive precautions for minimizing fire and explosion hazards.

The precautionary requirements specified herein for the use of flammable agents are essentially the same as those prescribed in the 1973 edition. Likewise this new edition highlights as possible sources of ignition, incendive sparks of electrical, electrostatic and percussive origin, naked flames and hot materials, and inadvertent mixing of flammable anaesthetic agents. It includes appropriate precautions covering the design, construction and furnishing of buildings, administration of hospitals, equipment and practices to be adopted by personnel.

In regard to intrinsically safe equipment, in general, requirements are only meaningful in relation to low–energy–consuming circuits such as those used with endoscopic instruments incorporating sensitive relays, thermionic valves or semiconductor devices. Attention is drawn to the fact that incandescent lamps may achieve temperatures which may be unsafe within hazardous locations. Cold light sources, e.g. fibreoptic, are regarded as satisfactory provided that the generator is located outside the hazardous area.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
MINIMIZING OF COMBUSTION HAZARDS ARISING FROM THE MEDICAL USE OF FLAMMABLE ANAESTHETIC AGENTS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard defines anaesthetizing locations and sets out requirements for minimizing the risk of fire and explosion arising from the medical use of flammable anaesthetic agents.

NOTES:

1. The prevention of fire and explosion depends not only on physical safeguards incorporated in the building structure and equipment, but also on a constant awareness of the hazards, and the adoption of specific precautions, by all persons concerned. Accordingly, information on the flammability of inhalational anaesthetics (see Appendix A), and on the nature of hazards (see Appendix B), has been included so that medical staff may appreciate the intent of this standard, and thus be better equipped to implement its requirements.
2. It is recognized that flammable liquids and gases other than for anaesthetic purposes may be used in theatres for skin preparation, aerosol spray applications or other clinical purposes. In such cases possible sources of ignition must be excluded from the area of application and the immediate surroundings. This standard, however, does not cover such situations, and in these instances reference should be made to Section 9 of AS 3000.

1.2 APPLICATION. The standard is relevant to all hospitals, and to rooms in industrial premises, dental surgeries, and the like, where anaesthetic agents are used.

In the application of the standard, it is essential that each operating theatre or other anaesthetizing location be designated either as not suitable for use with flammable anaesthetic agents or suitable (see Clause 1.6). If a decision is made to allow the use of flammable anaesthetic agents in a theatre or other location, then this standard which sets out the full precautions to be taken should be strictly implemented by those in authority (see Section 4).

1.3 REFERENCED DOCUMENTS. A list with titles of the standards referred to in this standard is given in the Annex.

1.4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.4.1 Flammable anaesthetic agent - an anaesthetic agent, compressed gas or volatile liquid, which burns or explodes when mixed with air, oxygen or nitrous oxide in the concentration range used in medical practice under normal ambient conditions. (See Appendix A.)

1.4.2 Anaesthetizing location - any area in which it is intended to apply or administer a medical anaesthetic agent (flammable or non-flammable) in the normal course of examination or treatment.

1.4.3 Hazardous anaesthetic locations or areas -

(a) Rooms used for bulk storage of flammable anaesthetic agents.

(b) Anaesthetizing locations where a flammable anaesthetic agent is to be used.

1.4.4 Hazardous anaesthetic zone - the region immediately around discharge points or potential discharge points of a flammable mixture of anaesthetic gases and vapours. This zone includes the region from the floor to 0.3 m above it, a region 0.3 m above and beyond the patient, the operating table and the anaesthetic system and the region below to the floor. (See Fig. 1.1).

1.4.5 Communicating location - an adjoining area within 2 m of a doorway communicating directly with a hazardous anaesthetic location as defined in Clause 1.4.3(b).

NOTE: Such areas are not considered to be hazardous anaesthetic locations, but are required to have conductive flooring to remove electrostatic charges from persons or objects before they enter a hazardous anaesthetic location.

1.4.6 Anaesthetic system - that part on the anaesthetic apparatus which may contain the anaesthetic mixture dispensed to the patient. This extends in sequence from the flowmeter manifold to the common gas outlet, breathing tubes, valves, absorber canisters, mask or endotracheal tube, scavenging tube and all interconnecting conduits.

1.5 COMPLIANCE WITH REGULATIONS OF STATUTORY AUTHORITIES AND OTHER CODES. Attention is drawn to the necessity of compliance with any relevant statutory regulations and codes, e.g. those applying to the design and construction of bulk storage rooms, and to the storage and safe handling of liquid oxygen and liquefied petroleum gases. Such regulations and codes shall be deemed to form part of this standard, being additional to any specific requirements contained herein.

1.6 AREA DESIGNATION.

1.6.1 General. Anaesthetic locations shall be designated as either suitable or not suitable for the use of flammable anaesthetic agents.