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MEDICAL GAS SYSTEMS—LOW PRESSURE FLEXIBLE CONNECTING ASSEMBLIES (HOSE ASSEMBLIES)

[Title allocated by Defence Cataloguing Authority:
HOSE ASSEMBLY, NON-METALLIC (L.P. Flexible, Medical Gas System Connections)]

This Australian standard was prepared by Committee MD/7, Anaesthetic Equipment and Medical Breathing Machines. It was approved on behalf of the Council of the Standards Association of Australia on 4 July 1986 and published on 6 October 1986.

The following interests are represented on Committee MD/7:

Australian and New Zealand Intensive Care Society

Australian Chamber of Commerce

Australian Society of Anaesthetists

Confederation of Australian Industry

Department of Health, N.S.W.

Department of Health, Qld.

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This standard was issued in draft form for comment as DR 85044.

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First published 1986

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 4351 5

PREFACE

This standard was prepared by the Association's Committee on Anaesthetic Equipment and Medical Breathing Machines under the direction of the Medical Materials and Equipment Standards Board.

The standard was prepared to complement AS 2896, Installation and Testing of Non-flammable Medical Gas Pipeline Systems. In essence, low pressure flexible gas connecting assemblies are the extension of the pipeline to the device being used for patient care.

Drafts emanating from ISO/TC121, together with BS 5682, Specification for Medical Gas Pipeline Systems: Terminal Units, Hose Assemblies and Connections to Medical Equipment, have been used extensively in the preparation of this standard.

A major variation from ISO and BS documents is that a special size hose is specified for oxygen. This is introduced as life-threatening situations are most likely to occur with interchange of oxygen and other gases. By recommending a different size for oxygen, the possibility of incorrect assembly of end connectors is reduced.

This standard also differs from the draft ISO standard in that the connections specified for the hoses are those of the Australian sleeve index system and not DISS or NIST.

Special care needs to be taken in the routine repair of low pressure flexible connecting assemblies as serious patient hazard exists if uninformed repairs are allowed. This standard pays particular attention to reducing these hazards.

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FOREWORD

This standard takes account of the need for a safe method of connecting medical equipment to a fixed medical gas pipeline system or other gas supply systems. Fixed medical gas pipelines, once installed, are rarely disturbed and are subjected to commissioning procedures to avoid the possibility of cross-connections or contamination of the medical gas conveyed. Low pressure flexible connecting assemblies are, throughout their relatively short service life, subjected to physical wear and tear, general misuse and abuse, and are frequently disconnected from the medical equipment and fixed pipeline. The importance of a maintenance procedure is therefore stressed within this document. Although no system is absolutely safe, this standard includes all elements considered necessary to prevent foreseeable hazards arising from the use of flexible connecting assemblies. Users should be continually alert to the possibility of damage being caused by external factors, such as trolleys, and anaesthetic machines.

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for

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1 SCOPE. This standard specifies requirements for low pressure flexible connecting assemblies for use with medical gas systems for clinical application.

Provision is made for the design, performance, identification and testing of low pressure flexible connecting assemblies used for conveying the medical gases at approximately 400 kPa and –60 kPa vacuum as listed in Table 1.

NOTE: Low pressure flexible gas connecting assemblies for surgical turbine tools are considered a special case as the hose itself is considered an integral tool interchangeable between different manufacturers. Therefore only the form of connection to the gas source is specified in this standard.

2 APPLICATION. This standard applies to low pressure flexible connecting assemblies which can be used to convey medical gases from the first point at which users can connect or disconnect gases available from a central supply system. It also applies to hoses which act as an extension of an existing hose and to hoses from other medical gas sources (see Figs 1 to 4) which can be connected or disconnected by the user.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 2700 Colour Standards for General Purposes

AS 2896 Medical Gas Systems—Installation and Testing of Non-flammable Medical Gas Pipeline Systems

BS 2050 Electrical Resistance of Conducting and Anti-static Products made from Flexible Polymeric Material

4 DEFINITIONS. For the purposes of this standard, the following definitions apply:

4.1 Low pressure flexible connecting assembly—an assembly which consists of a flexible hose with permanently attached gas specific connectors and which is designed to conduct a medical gas at approximately 400 kPa or for use with a vacuum service at a pressure of approximately 60 kPa below atmospheric pressure. This assembly is used to convey gas from the first connection point the user can make to the gas supply.

4.2 Supply connector—that part of a low pressure flexible connecting assembly by means of which it may be connected to the source of supply.

4.3 Equipment connector—that part of a low pressure flexible connecting assembly from which the gas exhausts, or enters in the case of vacuum.

4.4 Medical gas supply system—either

(a) an installation comprising central supply system, control equipment, a pipeline distribution system and terminal units at the point where medical gases or vacuum may be required; or

(b) an installation having no permanent pipeline system but employing a medical gas cylinder complete with pressure regulator.

4.5 Hose insert—that portion of a connector which is pushed or screwed into the lumen of the hose.

4.6 Sleeve index system (SIS)—a gas specific coupling which may be a screwed connection or a quick connection. Gas specificity is achieved by a sleeve concentrically around the retention coupling. The sleeve diameter is specifically indexed for the gas in use and mates with a corresponding groove which is also indexed. There is no specificity in the retention coupling.

4.7 Sleeved indexed system screwed connector—the internally threaded end fitting on a hose which incorporates a sleeve index coding.

4.8 Quick connector—a non-threaded gas specific assembly which fits together by means of a single hand action to effect a gas flow.

5. HOSE

5.1 Diameter. Where non anti-static tubing is used, the nominal inside diameter of a hose for medical oxygen shall be 5 mm and, for all other medical gases, 8 mm.

Tolerance on bore shall be as follows:

(a) For 5 mm ID . . . . . ± 0.5 mm

(b) For 8 mm ID . . . . . ± 0.75 mm

NOTE: Life threatening situations are most likely to occur with interchange of oxygen and other gases. Diameter specificity assists in overcoming this hazard.

5.2 Contamination of gas. Passage of gas through the hose shall neither elute odorous, noxious nor toxic material, nor generate particulate matter inherent in the material or residual from manufacture.

5.3 Anti-static properties. Where a hose is nominated as being suitable for use within flammable locations, the electrical conductivity of the hose shall comply with BS 2050.

5.4 Identification. The hose shall be identified in a permanent manner for the gas which it is intended to convey by means of the colour coding given in Table 1. Identification shall be as follows:

(a) For non anti-static hoses used for oxygen, nitrous oxide and air, and all non anti-static hoses, colouration of the hoses shall be throughout their length.

(b) For other gases and anti-static hoses—

(i) bands of colour applied to both ends of the hose. These bands shall be not less than 25 mm in width and shall extend completely around the circumference of the hose; or

(ii) a coloured disc at both ends.