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Australian Standard®

DENTAL EQUIPMENT—COMPRESSED AIR SYSTEMS

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The following interests are represented on Committee DN/4:

Australian Chamber of Commerce

Australian Dental Association

Australian Dental Standards Laboratory

Australian Dental Trade Association

Confederation of Australian Industry

Dental Hospitals

Dental Profession

Department of Defence

The Royal Dental Hospital of Melbourne

United Dental Hospital of Sydney

University of Melbourne, Dental School

University of Sydney, Dental School

Victorian Employers Federation

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PREFACE

This standard was prepared by the Association's Committee on Dental Equipment at the request of the dental trade which was concerned with safety and interchangeability aspects as well as performance levels. It specifies performance and pipeline requirements for single and multiple chair compressed air systems and the quality of air delivered from one or more air compressors. The standard does not cover compressed air supplied from cylinders as such systems are rarely found in dental practice.

The air needs to be dry, oil-free, odour-free and particulate-free to avoid damage to the instruments used, and to produce moisture-free areas. Hydrocarbon determination has been of much concern to the committee, and the instrument used in Appendix B has been found to be suitable. Tests have confirmed its value for determining the level of condensed hydrocarbons in dental compressed air.

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FOREWORD

Dental compressed air 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 cross connections, plumbing errors and obstruction of flow by material left in the pipelines.

For this reason it is strongly recommended that the following procedures to avoid these hazards be instituted:

(a) The client should insist on documentation of the tests and results from those responsible for doing the construction, and that these form a permanent record.

(b) In addition, *the client should independently inspect the system* using qualified personnel, or an independent outside contractor, to confirm and document the system's satisfactory operation.

Components of the dental compressed air system should be obtained and installed under the supervision of a trained person familiar with the proper practices for their construction, installation and use. Uncontrolled release of compressed air can be hazardous to personnel.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian standard for DENTAL EQUIPMENT—COMPRESSED AIR SYSTEMS

1 SCOPE. This standard specifies requirements for compressed air systems used solely for dental purposes. It covers safety aspects, construction, testing, operation and maintenance.

The compressed air is used for operation of dental hand pieces in the dental surgery, operating theatres and laboratory. The air is also used for drying of tooth and other surfaces and driving non-rotary instruments such as scalers and packers.

The standard does not cover compressed medical breathing air and air venturi operated suction systems which are the subjects of separate standards. Due allowance needs to be made in the design capacity of the system for air venturi operated suction if such equipment is included.

2 REFERENCED DOCUMENTS. The following standards are referred to in this document:

AS 1167 Welding and Brazing—Filler Metals: Part 1—Filler Metal for Brazing and Braze Welding

AS 1169 SAA Medical Agents and Gases Safety Code:
Part 2—Installation and Testing of Non-flammable Medical Gas Pipeline Systems*

AS 1210 SAA Unfired Pressure Vessels Code

AS 1259 Sound Level Meters

AS 1345 Identification of the Contents of Piping, Conduits and Ducts

AS 1432 Copper Tubes for Water, Gas and Sanitation

AS 1571 Seamless Copper Tubes for Use in Refrigeration

AS 2700 Colour Standards for General Purposes

AS 3000 SAA Wiring Rules

AS 3003 SAA Code for Electrical Installations in Electromedical Treatment Areas

BS 1701 Air Filters for Air Supply to Internal Combustion Engines and Compressors Other than for Aircraft

BS 3928 Method for Sodium Flame Test for Air Filters (Other than for Air Supply to i.c. Engines and Compressors)

BS 4196 Sound Power Levels of Noise Sources

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

3.1 Compressed dental air—normal air of the lower atmosphere that is compressed and filtered and delivered directly to dental equipment.

3.2 Pressure dew-point—the temperature at which water vapour starts to condense when compressed air is cooled.

3.3 Dental compressed air system—central supply with control equipment, a distribution pipeline and dental compressed air service points (see Fig. 1).

3.4 Source of supply—includes the air compressor(s), dryers, filters, control equipment, warning devices and that portion of the pipeline up to and including the main pipeline shut-off valve (see Fig. 2).

3.5 Control equipment—those items such as pressure control regulators, relief valves, alarm initiators, manual and automatic valves necessary to maintain compressed air at a set pressure within the pipeline distribution system.

3.6 Pipeline distribution system—that part of the compressed air system linking the source of supply to the dental compressed air service points and includes any necessary branch isolation valves. It will include any secondary pipeline pressure regulator required to reduce the pressure in a part of the distribution system.

3.7 Hose insert (hose tail)—that portion of a connector which is pushed in and secured within the lumen of a hose.

3.8 Dental compressed air service point—the isolating valve or coupling to make a connection from the surgery equipment to the dental compressed air service pipeline.

4 REQUIREMENTS FOR DENTAL COMPRESSED AIR.

4.1 Quality.

4.1.1 *Water vapour.* The pressure dew-point for indoor installations should be at least 10°C below the minimum temperature to which any part of the system is exposed at any season of the year. When measured in accordance with Appendix A, the pressure dew point should in no case exceed 2°C.

4.1.2 *Condensed hydrocarbons.* When determined in accordance with Appendix B, the condensed hydrocarbons shall not exceed 0.5 mg/m^3 of free air.

4.1.3 *Particulate matter.* A filter, capable of removing particles greater than 0.1 μm shall be fitted between the control equipment and the pipeline distribution system (see Clause 5.3.7).

4.1.4 *Odour.* Specific measurement of odour in air is impracticable. The presence of any odour should render the air unsatisfactory for dental purposes.

4.2 Performance. When determined in accordance with Appendix C, the pressure of air delivered at each dental compressed air service point shall not fall below 600 kPa over a period of 1 min with a flow rate of 85 L/min. The temperature of air delivered at the dental compressed air service point shall not exceed 37°C.

* Part 2 is in course of revision and when published will have a new AS number.