

~~LOAN COPY~~
~~INFORMATION CENTRE~~
~~STANDARDS AUSTRALIA~~

*Dup
Amendment 1, Feb 1990*

AS 2251-1979
UDC 614.442:614.48

Australian Standard
2251-1979

WITHDRAWN:
19990701

**LAMINAR AIRFLOW
ENCLOSURES FOR
PROTECTION OF
HOSPITAL PATIENTS**



STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter



THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Institute of Refrigeration, Air Conditioning and Heating
Australian Medical Association
Confederation of Australian Industry
CSIRO, Division of Animal Health
Department of Defence
Department of Construction
Department of Public Works, N.S.W.
Firms and Consultants Specializing in Equipment and Design for Controlled Environments
Health Commission of N.S.W.
Health Commission of Victoria
National Association of Testing Authorities, Australia
National Biological Standards Laboratory
National Council of Chemical and Pharmaceutical Industries
Royal Australian Institute of Architects

This standard, prepared by Committee MS/28, Controlled Environments, was approved on behalf of the Council of the Standards Association of Australia on 26 February 1979, and was published on 1 June 1979.

To keep abreast of progress in industry, Australian standards are subject to regular review. Suggestions for improvement, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 77155.

Amendment No 1
February 1980

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

Amendment No 1

to

AS 2251—1979

**LAMINAR AIRFLOW ENCLOSURES FOR PROTECTION OF
HOSPITAL PATIENTS**

SUMMARY: The following section of the standard is covered by this amendment: Clause 6.1.

Published on 1 March 1980.

AUSTRALIAN STANDARD SPECIFICATION

**LAMINAR AIRFLOW
ENCLOSURES FOR
PROTECTION OF
HOSPITAL PATIENTS**

AS 2251—1979

First published 1979

**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.**



ISBN 0 7262 1653 4

PREFACE

This standard was prepared by the Association's Committee on Controlled Environments in response to a request from the Association's Committee on Medical Materials and Equipment Standards.

The enclosures specified in this standard are intended for use in various hospital departments in which contaminated air constitutes a risk to the patient and where satisfactory reduction of airborne microbial contamination cannot be obtained with conventional turbulent flow ventilation.

This standard requires reference to the following Australian standards:

- AS 1217 Method of Measurement of Airborne Sound Emitted by Machines
- AS 1324 Air Filters for Use in Air Conditioning and General Ventilation
- AS 1386 Cleanrooms and Work-stations
- AS 1680 Code of Practice for Interior Lighting and the Visual Environment
- AS 1765 Code of Practice for Artificial Lighting for Clinical Observation
- AS 1807 Methods of Test for Cleanrooms, Work-stations and Their Accessories
 - .3—Air Velocity and Uniformity of Laminar Flow Cleanrooms
 - .4—Air Velocity Under Loaded Filter Conditions of Laminar Flow Cleanrooms
 - .5—Induced Air Leakage
 - .6—Final Filter Installation Integrity
 - .8—Gross Particle Count in Work Zone by Automatic Particle Counter
 - .11—Air Flow Parallelism and Dispersion in Laminar Flow Cleanrooms
 - .12—Temperature and Relative Humidity
 - .13—Humidity by Psychrometer Aspiration
 - .16—Sound Level in Cleanrooms
 - .17—Vibration in Cleanrooms

©Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1979

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

CONTENTS

	<i>Page</i>
FOREWORD	4
SPECIFICATION	
1 Scope	5
2 General Requirements	5
3 Construction Requirements	5
4 Air Cleanness	7
5 Supply Air and Fresh Air	7
6 Air Movement	7
7 Induced Air Leakage	7
8 Final Filter Installation	7
9 Temperature	7
10 Relative Humidity	7
11 Lighting	7
12 Sound levels	8
13 Vibration	8

STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard Specification
for
LAMINAR AIRFLOW ENCLOSURES FOR
PROTECTION OF HOSPITAL PATIENTS**

FOREWORD

Research has been conducted over many years into hospital-acquired infections. The air surrounding the patient has been identified as a source of infection, but the significance of this route during the various stages of patient treatment in hospitals is still being investigated.

Infection acquired in hospitals may arise from the patient's own body (endogenous) or from some external source (exogenous) such as other patients, staff or the physical environment. Transmission of bacteria to a susceptible patient may be achieved by several routes, and attempts at interruption of this should be apportioned according to the relative importance of a particular route for a particular organism. The use of advanced technology to prevent airborne transmission of organisms should not detract from the greater importance of direct contact transmission.

Patient enclosures employing laminar flow are the most effective method of providing air with virtually no bacterial contaminants to the surface of susceptible patients. Where the airborne route for transmission of infection constitutes a significant risk to a patient, the use of patient enclosures should be considered.

SPECIFICATION

1 SCOPE. This specification sets out requirements for laminar airflow enclosures for the protection of hospital patients. These enclosures are used where risk of infection by airborne bacteria is considered significant, such as in critical infection risk surgery, treatment of burns and intensive care.

NOTE: No claim is made regarding the protection from infectious patients of other people, including hospital staff, by means of the specified enclosure.

2 GENERAL REQUIREMENTS. The enclosure shall consist of a space contained by fixed or demountable walls and ceiling impervious to airflow. Air filtered through high efficiency particulate air (HEPA) filter(s) shall pass through this space in a unidirectional or laminar flow pattern. The air may originate at either the ceiling or at one wall.

The enclosure shall comply with specified limits in respect of temperature, relative humidity, lighting, sound levels and vibration (see Clauses 9 to 13).

NOTE: A typical horizontal airflow enclosure with retractable walls is illustrated in Fig. 1.

3 CONSTRUCTIONAL REQUIREMENTS.

3.1 Containment Walls. Containment walls shall be non-porous and easy to clean, and shall consist of rigid or flexible material that is impervious to airflow. The walls shall extend at least 750 mm beyond the work zone in the direction of airflow.

3.2 Prefilters. Prefilters complying with AS 1324 shall be used to prolong the life of the final filters (see Clause 3.4). The efficiency and dust-holding capacity of the prefilters should be chosen to be appropriate to the anticipated contamination load and with due consideration to the desired life of both filters.

3.3 Prefilter Pressure Drop Indicator. An indicator, which indicates that the limit of pressure differential of the prefilters has been reached, shall be fitted.

3.4 Final Filters. Final filters shall be HEPA type complying with AS 1324.

NOTE: Any repairs to filter media should be made by agreement, and should have regard to the fact that the turbulence may extend downstream of the filter outlet area for a distance of up to six times the maximum dimension of the patch-repaired surface.

3.5 Incoming Air Filter Bank. The area of the incoming air filter bank of a laminar flow enclosure shall be equal to the cross-sectional area of the clean enclosure measured at right-angles to the direction of the airflow.

NOTE: The fitting of a shadowless light mounting will cause turbulence which may extend downstream of the mounting for a distance of up to six times the maximum dimension of the mounting, i.e. at right-angles to the direction of airflow.

3.6 Motor Blower. When tested in accordance with AS 1807.3 and AS 1807.4 with a static pressure increase of 175 Pa imposed upon the fan, the motor blower shall maintain the air velocity specified in Clause 6.1.