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BIOLOGICAL SAFETY CABINETS—INSTALLATION AND USE

STANDARDS ASSOCIATION OF AUSTRALIA
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Australian Institute of Refrigeration, Air Conditioning and Heating

Australian Medical Association

Commonwealth Serum Laboratories

Confederation of Australian Industry

CSIRO, Australian National Animal Health Laboratory

Department of Housing and Construction

Department of Defence

Firms and Consultants specializing in equipment and design for controlled environments

Health Commission of Victoria

Health Department of New South Wales

National Association of Testing Authorities, Australia

National Biological Standards Laboratory

National Council of Chemical and Pharmaceutical Industries

Public Works Department, N.S.W.

Royal Australian Institute of Architects

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BIOLOGICAL SAFETY CABINETS—INSTALLATION AND USE

AS 2647—1983

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PREFACE

This standard was prepared by the Association's Committee on Controlled Environment to satisfy the need for a guide to the two classes of biological safety cabinets specified in Parts 1 and 2 of AS 2252, Biological Safety Cabinets.

The issue in 1972 of a public review draft DR 72168 for cleanrooms and workstations drew a comment from the Commonwealth Serum Laboratories which pointed to the need for work to be done under aseptic conditions and the need to contain potentially dangerous materials, and to the fact that the standards then proposed did not adequately cater for these situations.

A need has been established for standards applying to cabinets designed to minimize the immediate risks from aerosols to personnel working with hazardous biological agents. There is an increasing awareness of the hazards of exposure to infectious agents that present an actual or potential risk to people handling them. However, it must be appreciated that biological safety cabinets act only as the primary protective barrier and secondary and tertiary barriers are necessary to establish a safe laboratory environment. A quaternary barrier may be necessary to ensure a safe community environment.

In the preparation of this standard, reference was made to the booklet published by the United States Department of Health, Education and Welfare, Public Health Service entitled 'Classification of Etiological Agents on the Basis of Hazard'. Although written for American conditions, this booklet describes the basis for such classification of agents, and lists bacterial, fungal, parasitic, viral, rickettsial and chlamydial agents in five classes. The least hazardous agents are in Class 1 and those requiring the greatest restrictions are in Class 4. Class 5 contains agents which are specifically excluded from the U.S. by law. The list of organisms prohibited in Australia differs somewhat from the American list. Details can be obtained from the Quarantine Division of the Department of Health, Canberra.

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FOREWORD

This standard applies to the two classes of cabinets specified in Parts 1 and 2 of AS 2252. Classes I and II provide equal protection for personnel against agents of ordinary, potential or special hazard. Class III provides protection to personnel against agents of extreme or suspected extreme hazard and presents a special case not covered by this standard.

The choice of cabinet depends on the nature of the agent(s) being handled. A list of organisms of special hazard which are commonly found in Australia is given in Table 1.2.

The choice of cabinet introduces the question of containment and there are degrees of physical containment provided by the following barriers:

(a) *Primary barriers,* which provide immediate containment at the source. Examples are biological safety cabinets, centrifuge enclosures and ventilated animal enclosures.

(b) *Secondary barriers,* which provide secondary containment in the event of failure of the primary barrier. An example of a secondary barrier is the room (and its support facilities) within which the primary barrier is located.

(c) *Tertiary barriers,* which are the building(s) in which the secondary barrier(s) are housed.

(d) *Quaternary barriers,* which are the geographical sites for buildings constituting the tertiary barriers. An example of a quaternary barrier is an island.

Compliance with this standard should achieve the following:

(i) Protection, by the primary barrier, of personnel directly engaged in handling infectious materials.

(ii) Protection of supportive staff, animals and facilities in adjacent work areas and in the surrounding community.

(iii) For a Class II cabinet, protection of the product.

The Australian concept of self-contained cabinets is in contrast to that of some other countries, where the cabinet exhaust air is ducted into ventilating, airconditioning or exhaust systems which discharge to atmosphere introducing the possibility of uncontrollable variation in cabinet airflow velocity and pressure (see Appendix A).