

dup SUPERSEDED BY AS 2243.3-1985
under revision see DR 83064 of March 1983

AS 2243, Part 3—1979
UDC 614.8.006.25:54

Australian Standard 2243, Part 3—1979

SAFETY IN LABORATORIES PART 3—MICROBIOLOGY



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:

Agricultural and Veterinary Chemicals Association of Australia
Australian Chamber of Commerce
Australian Chemical Industry Council
Australian Council of Trade Unions
Australian Institute of Petroleum
Australian Medical Association
Australian Road Transportation Federation
Board of Fire Commissioners of New South Wales
Confederation of Australian Industry
Department of Defence
Department of Industrial Relations and Technology, New South Wales
Department of Minerals and Energy
Department of Productivity
Department of Science and the Environment
Department of Transport
Health Commission of New South Wales
Insurance Council of Australia
Metropolitan Fire Brigade Board, Melbourne
Public Health Department, Western Australia
National Health and Medical Research Council
Railways of Australia Committee
University of Sydney

This standard, prepared by Committee CH/9, Safe Handling of Chemicals, was approved by the Chemical Standards Board, on behalf of the Council of the Standards Association of Australia on 27 July 1979, and was published on 1 October 1979.

To keep abreast of progress in industry, Australian standards are subject to continuous review and are kept up-to-date by the issue of amendments or revised editions as necessary. It is important therefore that standards users ensure that their standards are up-to-date. Full details of all SAA publications will be found in the Annual List of Australian Standards; these details are supplemented by monthly listings in the SAA Monthly Information Sheet. Information on the Annual List and the SAA Monthly Information Sheet may be obtained from any sales office of the Association, where details are also available of the current status of individual standards.

This standard was issued in draft form for public review as DR 78035.

AUSTRALIAN STANDARD

**CODE OF PRACTICE FOR
SAFETY IN LABORATORIES**

**Part 3
MICROBIOLOGY**

AS 2243, Part 3—1979

First published1979

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

ISBN 0 7262 1762 X

PREFACE

This standard was prepared by the Association's Committee CH/9, Safe Handling of Chemicals, work in this area having subsequently been re-allocated to Committee CH/26, Safety in Laboratories. The need for this standard was recognized by Committee CH/9 and subsequently confirmed by an extensive survey conducted within government departments, industrial organizations and educational institutions.

It is the third Part in a series aimed at full coverage of the safety function in laboratories. It deals with microbiological aspects of laboratory work and is intended to be used in conjunction with other Parts in the series, each one relating to particular aspects of laboratory operations and to particular kinds of hazard. Emphasis is placed on awareness of risks, adequate hygiene and preventive action. Attention is given to the management and organization of work for preventing infection or contamination. Safety procedures and first aid measures are included, together with a useful bibliography.

Other Parts are as follows:

Part 1—General

Part 2—Chemical

Part 4—Ionizing Radiations

Part 5—Non-ionizing Radiations

Part 6—Mechanical Aspects

Part 7—Electrical Aspects

This standard deals specifically with safe practices in laboratories and does not cover the design and construction of laboratories, which is the subject of a

separate standard being prepared by a committee within the Association's Building and Civil Engineering Group.

Attention is drawn to the loose-leaf format of this standard, which is intended to facilitate rapid revision by substitution of replacement pages or addition of new ones. Users wishing to suggest revisional material are invited to submit the full wording of replacement pages or clauses, to assist in the process of prompt revision.

This Part makes reference to the following Australian standards:

AS 1113	Laboratory Humidity Cabinets (Non-Injection Type)
AS 1132	Methods of Test for Air Filters for Use in Air Conditioning and General Ventilation
AS 1324	Air Filters for Use in Air Conditioning and General Ventilation
AS 1336	Code of Practice for Industrial Eye Protection
AS 1337	Industrial Eye Protectors
AS 1885	Code of Practice for Recording and Measuring Work Injury Experience
AS 2252	Biological Safety Cabinets
AS	Laboratory Design and Construction for Safe Working Conditions*

*In course of preparation.

©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>		<i>Page</i>
SECTION 1. SCOPE AND GENERAL		5.2 Segregation of Special Areas	7
1.1 Scope	4	5.3 Sample Receiving Area	7
1.2 Introduction	4	5.4 Specimen Receiving Area	7
1.3 Definitions	4	SECTION 6. SPECIAL SAFETY EQUIPMENT	
SECTION 2. ORGANIZATION		6.1 Personal Protective Equipment	8
2.1 Management Tasks	5	6.2 Eye Protection Apparatus	8
2.2 Designated Safety Officer	5	6.3 First Aid Kit	8
SECTION 3. EXAMPLES OF HAZARDS		6.4 Apparatus for Gnotobiotics Procedures	8
3.1 Personal	5	6.5 Safety Cabinets	8
3.2 Airborne Infection	5	6.6 Trays and Covers	8
3.3 Samples and Reagents	5	6.7 Airconditioning Systems	8
3.4 Wounds and Infections	5	SECTION 7. LABORATORY PROCEDURES	
3.5 Dermal Entry of Infection	5	7.1 General	9
3.6 Air Filtration	5	7.2 Accidents	10
3.7 Freeze-dried Cultures	5	7.3 Waste Disposal	10
3.8 Contents of Petri Dishes	5	7.4 Transport	10
3.9 Steam Pressure Vessels	5	SECTION 8. ANIMALS AND ANIMAL HOUSES	
3.10 Transport	5	8.1 Special Areas	11
SECTION 4. PERSONAL HYGIENE AND BEHAVIOUR		8.2 Cross-infection	11
4.1 Vigilance	6	8.3 Cages and Racks	11
4.2 Personal Habits	6	8.4 Personal Protection	11
4.3 Safety Provisions and Facilities	6	8.5 Inoculation Procedures	11
4.4 Personal Nature of Responsibility	6	8.6 Dissection	11
4.5 Behaviour	6	8.7 Decontamination and Waste Disposal	11
4.6 Non-routine Equipment	6	APPENDICES	
4.7 Injuries and Illness	6	A Disinfectants and Antiseptics	12
4.8 Cross-contamination	6	B Biological Hazard Warning Symbol	15
SECTION 5. WORK AREAS		C Work Injury Report	17
5.1 Identification of Risks	7	D References and Bibliography	18

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
CODE OF PRACTICE FOR SAFETY IN LABORATORIES

PART 3—MICROBIOLOGY

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Part of the code is intended only for use in microbiological aspects of laboratory work; biohazards involved in other types of biological laboratory work are not considered. Nor are these guidelines sufficiently comprehensive to apply to laboratories engaged in research in molecular biology or genetics, or to those handling highly infectious pathogens, e.g. certain *Brucella* spp. They are intended only for laboratories, including animal houses, where microbiological work such as quality control or regulatory analysis is undertaken, e.g. of foodstuffs, water and effluents, pharmaceuticals and cosmetics or for teaching and hospital laboratories. Details of other, e.g. fire, chemical, hazards are dealt with in other Parts of this code.

1.2 INTRODUCTION.

1.2.1 Safety Attitudes. Safety in all laboratories must be regarded as an individual and personal, as well as a management, responsibility. Staff training should be directed toward making safety considerations an attitude of mind and an integral part of all laboratory procedures, so that a constant, purposeful, control of the laboratory environment will result.

1.2.2 Specific Microbiological Problems. Microbiological laboratories pose specific problems in addition to many of those commonly encountered in chemical laboratories. Paramount is the possibility of infection, both of laboratory staff, and of the general public or of animals (by dissemination of pathogens outside the laboratory). Infection can result from ingestion, inhalation or skin penetration. In particular, staff having little or no microbiological training, e.g. laboratory attendants and new recruits, should not be exposed to situations in which they may not appreciate the potential hazards.

It is also important to prevent cross-contamination or contamination with adventitious microorganisms since they may completely nullify experimental procedures or lead to erroneous results. The latter occurring in a hospital or public health laboratory could well result in the erroneous or unnecessary treatment of patients.

1.2.3 Special Awareness Requirements. Microbiological hazards are particularly insidious because of the microscopic size of organisms. It is also essential to be aware that the 'unseen' hazard, e.g. formation of

an invisible aerosol, may be of greater significance than the more obvious accident. Further, organisms not generally regarded as pathogens may, in some circumstances, assume that role.

THE SAFEST PROCEDURE IS TO REGARD ALL MICROORGANISMS AS POTENTIAL PATHOGENS AND TREAT THEM ACCORDINGLY.

All laboratories should note that a classification of microorganisms according to hazard has been published by the U.S. Public Health Service.*

1.3 DEFINITIONS. For the purpose of this Part of the code, the following definitions apply:

1.3.1 Microbiology—the study of living organisms which are of microscopic size or contain a microscopic stage in their life-cycle.

1.3.2 Aseptic technique—the exercise of special procedures for maintaining the sterility of equipment, media, etc or the purity of cultures by eliminating adventitious contamination.

1.3.3 Viable—living; capable of growth even though resuscitation procedures may be required, e.g. when organisms are freeze-dried, sub-lethally damaged.

1.3.4 Pathogen—an organism capable of causing disease in man, animals or plants.

1.3.5 Cross-contamination—the undesirable transfer of organisms from one person, material or environment to another.

1.3.6 Antiseptic—a substance capable of destroying or preventing growth of microorganisms under prescribed conditions of use and specifically for application to living tissues.

1.3.7 Disinfectant—a substance capable of killing pathogenic microorganisms, usually confined to the treatment of inanimate objects.

1.3.8 Sterilization—an act or process which kills all living organisms, applied particularly to viruses, bacteria and moulds, and their spores.

1.3.9 Infectious—capable of invading a susceptible host, multiplying in it, and causing an altered host reaction, commonly called a disease.

*See Reference D2.6.