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SAFETY IN LABORATORIES PART 2—CHEMICAL



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
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Department of Defence
Department of Labour and Industry, 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

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

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AUSTRALIAN STANDARD

**CODE OF PRACTICE FOR
SAFETY IN LABORATORIES**

**Part 2
CHEMICAL**

AS 2243, Part 2—1979

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PREFACE

This standard was prepared by the Association's Committee on Safety in Laboratories under the direction of the Chemical Standards Board.

It is the second Part of an overall standard designed to promote safety in laboratory operations, and is aimed at specific aspects of safety common to chemical laboratories. Essential safety procedures and recommended practices are outlined in respect of flammable, toxic, unstable, and highly reactive chemicals. Special coverage is given to the handling and storage of compressed and liquefied gases.

Other Parts are as follows:

Part 1—General

Part 3—Microbiology

Part 4—Ionizing Radiations

Part 5—Non-ionizing Radiations

Part 6—Mechanical Aspects

Part 7—Electrical Aspects

It is recommended that in respect of chemical laboratories Part 1 be obtained for use in conjunction with this Part, and that additional Parts be obtained where justified by the type of operations carried out in the particular laboratory.

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 1076 Code of Practice for Selection, Installation and Maintenance of Electrical Apparatus and Associated

Equipment for Use in Explosive Atmospheres

AS 1169 SAA Medical Agents and Gases Safety Code

AS 1216 Code of Practice for Safe Handling of Dangerous Goods
Part 1—Classification and Class Labels for Dangerous Goods

AS 1336 Code of Practice for Industrial Eye Protection

AS 1337 Industrial Eye Protectors

AS 1715 Code of Practice for Respiratory Protection

AS 1716 Respiratory Protective Devices

AS 1846 Dry Chemical Type Portable Fire Extinguishers

AS 1847 Carbon Dioxide Type Portable Fire Extinguishers

AS 1848 Halogenated Hydrocarbon Type Portable Fire Extinguishers

AS 1894 Code of Practice for the Safe Handling of Cryogenic Fluids

AS 2030 SAA Gas Cylinders Code

AS 2161 Industrial Safety Gloves and Mittens (Excluding Electrical and Medical Gloves)

AS 2208 Safety Glazing Materials for use in Buildings (Human Impact Considerations)

AS 2210 Safety Footwear

AS Laboratory Design and Construction for Safe Working Conditions*

*In course of preparation.

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CONTENTS

	<i>Page</i>		<i>Page</i>
SECTION 1. SCOPE, DEFINITIONS AND ORGANIZATION OF LABORATORY SAFETY		3.3 Handling of Gases Compressed or Liquefied in Cylinders	10
1.1 Scope	4	3.4 Cryogenics	10
1.2 Definitions	4	3.5 Emergency Measures and First Aid	13
1.3 Organization of Laboratory Safety	4		
SECTION 2. HAZARDS OF CHEMICAL SUBSTANCES		APPENDICES	
2.1 Sources of Hazards	7	A Some Common Unstable Substances	15
2.2 Display of Charts....	7	B Some Common Highly Reactive Chemicals	16
2.3 Flammable Chemicals	7	C Some Common Flammable Chemicals	18
2.4 Toxic (Poisonous) Chemicals	8	D Some Common Toxic Chemicals	19
2.5 Unstable Chemicals	8	E Some Commonly Encountered Carcinogens	21
2.6 Highly Reactive Chemicals	8	F Treatment of Ether Containing Peroxides	22
SECTION 3. COMPRESSED AND LIQUEFIED GASES		G Safety Precautions for Specific Cryogenic Materials	23
3.1 Storage	10	H Safe Handling of Perchloric Acid	24
3.2 General Principles	10	J Work Injury Report	26
		K Bibliography....	27

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
**CODE OF PRACTICE FOR
 SAFETY IN LABORATORIES**

PART 2—CHEMICAL

**SECTION 1. SCOPE, DEFINITIONS AND ORGANIZATION OF
 LABORATORY SAFETY**

1.1 SCOPE. This Part of the code outlines essential and recommended practices, and information on hazards, necessary for the safe conduct of operations within chemical laboratories.

1.2 DEFINITIONS. For the purposes of this Part of the code, the following definitions apply:

Flammable—capable of being readily ignited and of burning in air.

Flashpoint—the lowest temperature at which application of a small flame causes the vapour above a flammable liquid to produce a momentary flash when it is heated under standardized conditions of test laid down by an appropriate test method. (See AS 1216, Part 1 and AS 2106.)

Auto-ignition temperature—the lowest temperature at which a vapour will spontaneously catch fire in air.

NOTE: If vapour from a liquid at room temperature is carried by draught into contact with a surface above the ignition temperature, the vapour may ignite and burn back to ignite the liquid.

Toxic (poisonous) chemical—a substance which, when introduced in sufficient quantity into an animal organism by ingestion, inhalation or absorption, destroys or threatens to destroy life, or injures health.

NOTE: The word 'toxic' has the same meaning as 'poisonous'.

Threshold limit value (TLV)—a reference to the airborne concentrations of substances. TLVs are guides to provide safe workroom air for nearly all workers. They may be expressed in three ways; most commonly as time-weighted averages for the working week, but also as ceiling values which should never be exceeded, or as short-term exposure limits. These values are subject to review in the light of any new knowledge.

NOTE: For currently accepted TLV figures, refer to 'Atmospheric Contaminants', published by the National Health and Medical Research Council, and based on the recommendations of the American Conference of Governmental Industrial Hygienists.

Cryogenic fluids (see AS 1894)—fluids having a boiling point below 200 K (−73°C) at atmospheric pressure (i.e. approximately 100 kPa).

NOTE: The limiting temperature selected for defining cryogenic substances is somewhat arbitrary and many variations appear in the literature. This definition is satisfactory for the present purpose but may vary from others encountered elsewhere.

Accident—any incident that has caused or might reasonably be expected to have caused injury to persons, or damage to property or both.

1.3 ORGANIZATION OF LABORATORY SAFETY.

1.3.1 Safe Conduct.

- (a) Never adopt a casual attitude in the laboratory and always be conscious of the potential hazards.
- (b) Ensure that appropriate protective clothing and devices are provided and used, i.e. as approved under Australian standards.
- (c) Never run in the laboratory or along corridors.
- (d) Never indulge in horseplay in the laboratory.
- (e) Always exercise care when opening and closing doors on entering or leaving the laboratory.
- (f) Do not work in isolation in a laboratory; a second person should be within call.
- (g) Do not handle or consume food or drink in laboratories.
- (h) Regard all substances as hazardous unless there is definite information to the contrary.
- (j) Never undertake any work unless the hazards of the operation are known as precisely as possible and the appropriate safety precautions adopted.
- (k) Always use safety carriers for transporting glass or plastics containers of 2 L or larger. Exercise particular caution when carrying containers of mutually reactive substances.

1.3.2 Housekeeping.

- (a) Keep benches, shelves and cupboards clean and tidy. Apparatus and reagents should be cleaned and put away immediately after use. Hazardous chemicals should be safely stored.
- (b) Clean up after each stage of an experiment. Apparatus which has contained harmful chemicals shall be rinsed before being left for final cleaning.
- (c) Clean up spilt material immediately, using a suitable procedure for that particular substance, so as to avoid the potential hazards resulting from corrosivity, fumes, slipperiness, reactivity, toxicity or flammability. Strong acids, for example, require the use of sodium carbonate to neutralize the acid. Suitable gloves and plenty of water are needed in cleaning operations, but not such quantities of water that the spillage is spread unnecessarily.

Absorbent materials should be used to clean up spills of organic liquids; flammable products should be cleaned up with absorbent rags.