

Australian/New Zealand Standard™

Safety in laboratories

Part 8: Fume cupboards



AS/NZS 2243.8:2006

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CH-026, Safety in Laboratories. It was approved on behalf of the Council of Standards Australia on 6 April 2006 and on behalf of the Council of Standards New Zealand on 13 April 2006.

This Standard was published on 26 April 2006.

The following are represented on Committee CH-026:

Australian Industry Group
Australian Institute of Occupational Hygienists
CSIRO
Department of Labour, New Zealand
Department of Primary Industries (Victoria)
Ministry of Economic Development, New Zealand
National Association of Testing Authorities, Australia
National Measurement Institute, Australia
New Zealand Chemical Industry Council
New Zealand Microbiological Society
Royal Australian Chemical Institute
Victoria WorkCover Authority
WorkCover New South Wales

Additional Interests:

Fume cupboard manufacturers
Fume cupboard testing organizations
Independent consultants
University of Sydney
University of Western Australia

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 04512.

Australian/New Zealand Standard™

Safety in laboratories

Part 8: Fume cupboards

Originated in Australia as AS 2243.8—1986.
Originated in New Zealand as NZS 7203:1987.
Previous edition AS/NZS 2243.8:2001.
Fourth edition 2006.

COPYRIGHT

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

PREFACE

This Standard was prepared by Subcommittee CH-026-08, Fume Cupboards, on behalf of the Joint Standards Australia/Standards New Zealand Committee CH-026, Safety in Laboratories, to supersede AS/NZS 2243.8:2001.

The objective of this Standard is to provide requirements for fume cupboards relating to their safety and performance, along with recommendations and procedures for their selection, installation, testing and use.

The majority of changes from the previous edition have been made to clarify requirements concerning the operation of isolators, the fire isolation of exhaust ducts, the use of exhaust filters and the test methods. Requirements concerning double-sided fume cupboards have changed so one sash needs to be fully closed at all times. Text concerning the siting of fume cupboards has been modified with some distances changed and some distances that were recommendations in the previous edition are now required minimum separations to prevent containment problems.

Attention is drawn to the last paragraph of the Foreword concerning upgrading of existing fume cupboards to comply with this Standard following their assessment for risk and implementation of interim control measures, if necessary, depending on the time frame decided for the upgrading program.

This Standard is Part 8 in a series aimed at promoting safety in laboratories.

The series is as follows:

- Part 1: Planning and operational aspects
- Part 2: Chemical aspects
- Part 3: Microbiological aspects and containment facilities
- Part 4: Ionizing radiations
- Part 5: Non-ionizing radiations—Electromagnetic, sound and ultrasound
- Part 6: Mechanical aspects
- Part 7: Electrical aspects
- Part 8: Fume cupboards (this Standard)
- Part 9: Recirculating fume cabinets
- Part 10: Storage of chemicals

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
FOREWORD.....	5
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	6
1.2 REFERENCED DOCUMENTS	6
1.3 DEFINITIONS	7
SECTION 2 TYPES, SERVICES AND COMPONENTS	
2.1 FUME CUPBOARD TYPES.....	10
2.2 SERVICES	11
2.3 BASE.....	13
2.4 SINK	13
2.5 SUMP.....	13
2.6 CHAMBER	13
2.7 SASH.....	13
2.8 BAFFLES.....	14
2.9 SUPPORT STRUCTURE.....	14
2.10 FUME SCRUBBERS AND WASH-DOWN FACILITIES.....	15
2.11 HEAT SHIELDS	15
2.12 WARNING LABEL	15
2.13 IDENTIFICATION LABEL	16
2.14 FIRE PROTECTION	16
SECTION 3 AIRFLOW, FUME EXHAUST AND DISPERSAL	
3.1 REQUIREMENTS FOR AIRFLOW INTO THE CUPBOARD.....	18
3.2 FUME EXHAUST AND DISPERSAL.....	20
SECTION 4 SITING AND COMMISSIONING	
4.1 SITING A FUME CUPBOARD	26
4.2 COMMISSIONING TESTS	27
SECTION 5 MAINTENANCE AND TESTING	
5.1 GENERAL	30
5.2 HOUSEKEEPING	30
5.3 DECONTAMINATION	30
5.4 SAFETY DURING MAINTENANCE	30
5.5 MAINTENANCE AND TESTING SCHEDULE	30
SECTION 6 USE OF FUME CUPBOARDS	
6.1 FUME CUPBOARD MANAGEMENT.....	32
6.2 BEFORE USE	33
6.3 DURING USE	34
6.4 AFTER USE.....	34
6.5 HAZARDOUS CHEMICALS	35

APPENDICES

A	METHOD FOR CONDUCTING A SMOKE TEST	36
B	METHOD FOR DETERMINING FACE VELOCITY	39
C	MATERIALS OF CONSTRUCTION	42
D	FUME CUPBOARDS FOR SPECIAL APPLICATIONS.....	46
E	GUIDE TO PROCUREMENT OF FUME CUPBOARDS AND ASSOCIATED EXHAUST SYSTEMS	52
F	EXAMPLE CHECKLIST AND REPORT FORM.....	55
G	RELATED DOCUMENTS.....	58

FOREWORD

The primary reason for using a fume cupboard is to provide safe working conditions for the operator and other laboratory personnel. The fume cupboard provides a mechanical means of capturing, diluting and exhausting all fume, especially that which is hazardous or noxious.

The efficiency and safety of a fume cupboard depends upon the smooth entry of air, effective containment and scavenging of fume from the chamber, its siting with respect to air movement and laboratory ventilation, the materials used in its construction, the complete fume exhaust system, its controls and, if fitted, cleaning system (e.g. scrubbers and filters) and the safe and remote dispersal of fumes to the atmosphere.

Existing fume cupboard installations will, in many instances, not comply with this Standard and consequently should not be used for applications that could create a hazard. In the interests of laboratory safety, a high priority should be allocated to the preparation of a program for upgrading sub-standard fume cupboard installations to meet the requirements of this Standard. Fully ducted fume cupboards that do not comply with this Standard should be replaced or upgraded to the required levels as soon as practicable.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Safety in laboratories

Part 8: Fume cupboards

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies safety requirements for fume cupboards and methods of test to be used to determine their performance. Appendix A provides the method for conducting a smoke test for a fume cupboard and Appendix B provides the method for determining face velocity. Appendix C describes typical materials used in the construction of fume cupboards and includes recommendations and requirements on material suitability.

Fume cupboards covered by this Standard are intended primarily for use in general chemical operations but may be used for the special applications set out in Appendix D, provided that the additional relevant features described therein are incorporated.

Recirculating fume cabinets (which recirculate air and do not extract to the outside atmosphere) are not included in this Standard (see AS/NZS 2243.9).

NOTE: Appendix E provides recommendations for the procurement of a fume cupboard. Appendix F provides an example checklist and report form for compliance testing and Appendix G lists documents relating to the subject of this Standard.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1444	Wrought alloy steels—Standard, hardenability (H) series and hardened and tempered to designated mechanical properties
1668	The use of ventilation and airconditioning in buildings
1668.2	Part 2: Ventilation design for indoor air contaminant control
1807	Cleanrooms, workstations, safety cabinets and pharmaceutical isolators—Methods of test
1807.15	Part 15: Determination of illuminance
1807.20	Part 20: Determination of sound level at installed workstations, safety cabinets and pharmaceutical isolators
1826	Electrical equipment for explosive atmospheres—Special protection—Type of protection s
1940	The storage and handling of flammable and combustible liquids
2243	Safety in laboratories
2243.4	Part 4: Ionizing radiations
2243.7	Part 7: Electrical aspects
2444	Portable fire extinguishers and fire blankets—Selection and location