Australian/New Zealand Standard™

Safety in laboratories

Part 9: Recirculating fume cabinets

Standards Australia

STANDARDS NEW ZEALAND
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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 22 September 2003 and on behalf of the Council of Standards New Zealand on 30 September 2003. It was published on 17 November 2003.

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
The New Zealand Chemical Industry Council
New Zealand Microbiological Society
Victorian WorkCover Authority
WorkCover New South Wales

Additional interests participating in the preparation of this Standard:

Fume containment consultants
Recirculating fume cabinet manufacturers
University of Sydney

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Part 9: Recirculating fume cabinets

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH-026, Safety in Laboratories, to supersede AS 2243.9—1991. It was originally prepared as a result of a request from the Royal Australian Chemical Institute and other organizations for a Standard covering minimum safety requirements for recirculating fume cabinets.

The main changes made to the Standard in preparing this edition are as follows:

(a) A clause stating the objective of this Standard has been added.

(b) The limitations of use have been modified to clarify when the use of recirculating fume cabinets is allowed for work with acids and to widen the focus from only high temperature and high humidity situations to all temperature and humidity extremes as they can affect both initial filter efficiency and retention of previously absorbed gases or vapours.

(c) A recommendation for a risk assessment process to be conducted prior to purchase of a recirculating fume cabinet has been added, along with guidance on issues to include in this.

(d) The requirement for individual face velocity readings to be within the range 0.5 m/s ±20% has been replaced with a requirement that the average face velocity be at least 0.5 m/s and a recommendation that individual readings be within 20% of the average face velocity. The key performance indicator for the recirculating fume cabinet was considered to be the smoke test.

(e) A minimum airflow requirement has been added to ensure an adequate volume of air is passed through the working chamber to move contaminants to the filter system.

(f) The methods for conducting smoke tests and face velocity tests and reporting the results have been aligned as much as possible with those used for fume cupboards.

(g) An example checklist has been added to assist when checking if a recirculating fume cabinet's construction and operation comply with the requirements in this Standard.

Other Standards in the series promoting safety in laboratories are as follows:

Part 1: General
Part 2: Chemical aspects
Part 3: Microbiological aspects and containment facilities
Part 4: Ionizing radiations
Part 5: Non-ionizing radiations
Part 6: Mechanical aspects
Part 7: Electrical aspects
Part 8: Fume cupboards
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.

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FOREWORD

Recirculating fume cabinets rely on filtration or absorption to remove airborne contaminants released in the cabinet, so that the exhaust air may be safely discharged back into the laboratory atmosphere. Recirculating fume cabinets are suitable for light to moderate use with a limited range of substances. The range of substances for which each cabinet can be used is limited by the need for compatibility with the particular type of absorber or filter fitted to the cabinet.

Small quantities of some radioactive materials can be used in recirculating fume cabinets provided that a reliable system is installed to monitor the cabinet exhaust, and that a qualified radiation safety expert is consulted on the safety aspects of radioactive materials.

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Australian/New Zealand Standard
Safety in laboratories

Part 9: Recirculating fume cabinets

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies safety requirements and gives recommendations for the design, manufacture, use and maintenance of recirculating fume cabinets, sometimes incorrectly referred to as 'ductless fume cupboards', and the test methods to determine their performance.

NOTE: Requirements for fume cupboards (which extract air to the outside atmosphere) are set out in AS/NZS 2243.8.

1.2 OBJECTIVE

The objective of this Standard is to provide manufacturers of recirculating fume cabinets with design and performance requirements for the cabinets and their filtration systems, and users with requirements and recommendations for their selection, use and maintenance, in order to prevent users selecting or using inappropriate equipment.

1.3 LIMITATIONS OF USE

The recirculating fume cabinet shall not be used in the following circumstances (see also Clauses 6.2 and 6.6.2.4):

(a) For work with organic solvents which are only physically absorbed on the absorber and the solvents—

  (i) have boiling points less than 75°C; and

  (ii) are evaporated in quantities of more than 50 mL per day.

  NOTE: Vapours from these organic solvents can be insufficiently delayed on the filter unless chemisorption takes place, i.e. a chemical reaction between the absorbent and the solvent vapour.

(b) Where more than 50 mL of corrosive liquids that normally evolve significant fumes are involved in a reaction.

(c) Where perchloric acid digestions are carried out.

(d) Where other acid digestions are carried out except where these are conducted in closed systems.

(e) Where pathogenic organisms are handled (see AS/NZS 2647 and AS 2252).

(f) Where Category 1 and Category 2 carcinogens (see NOHSC 1008), except those which are chemisorbed by the filter, are used.