

Australian Standard[®]

**Workplace atmospheres—Method for
sampling and gravimetric determination
of respirable dust**



This Australian Standard® was prepared by Committee CH-031, Methods for Examination of Workplace Atmospheres. It was approved on behalf of the Council of Standards Australia on 14 September 2009.

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The following are represented on Committee CH-031:

- Australian Aluminium Council
 - Australian Chamber of Commerce and Industry
 - Australian Institute of Occupational Hygienists
 - Australian Mines and Metals Association
 - Bureau of Steel Manufacturers of Australia
 - Clean Air Society of Australia & New Zealand
 - Coal Services
 - Commonwealth Department of Health and Ageing
 - Department for Administrative and Information Services, SA
 - Department of Consumer & Employment Protection, WorkSafe Division, WA
 - Department of Mineral Resources, NSW
 - National Association of Testing Authorities Australia
 - WorkCover New South Wales
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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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**Workplace atmospheres—Method for
sampling and gravimetric determination
of respirable dust**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH-031, Methods for the Examination of Workplace Atmospheres, to supersede AS 2985—2004, *Workplace atmospheres—Method for sampling and gravimetric determination of respirable dust*. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this revision is to enable calibration laboratories to meet the requirements for the balance and uncertainty requirements.

During the course of the preparation of this Standard, the Committee became aware of new technology for personal respirable dust monitoring, using a tapered element oscillating microbalance technique, but it was decided not to address this issue at this time and to leave it for a future date.

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

Most airborne industrial dusts contain particles of a wide range of sizes. The behaviour, deposition and fate of any particle after entry into the human respiratory system and the response that it elicits depends on the nature and size of the particle.

Occupational hygiene practice commonly differentiates between two size fractions of airborne dust, namely respirable and inhalable dust. Where particles may have toxic effects if absorbed in the nasopharyngeal (nose and throat) region or may have toxic effects if ingested after deposition in this region, it is appropriate to measure the mass concentration of inhalable particles in the atmosphere. It may also be apt to measure this size fraction for particles that exhibit no specific toxic effects, namely ‘particulates/dusts not otherwise classified.’ AS 3640, *Workplace atmospheres—Method for sampling and gravimetric determination of inhalable dust*, should be referred to for determining inhalable particles in workplace atmospheres.

Respirable particles can be measured when the nature of these particles is such that they exhibit toxic effects primarily when deposited in the alveolar region (deepest reserve) of the lungs. This usually applies to toxic insoluble particles that accumulate in the lungs such as crystalline silica, coal dust and cadmium oxide fume. This Standard sets down the method for determining the mass concentration of these respirable sized particles in workplace atmospheres.

STANDARDS AUSTRALIA

Australian Standard
**Workplace atmospheres—Method for sampling and gravimetric
determination of respirable dust**

1 SCOPE

This Standard sets out a method of the collection and gravimetric determination of respirable dust in workplace atmospheres. This method does not consider the measurement of ‘inhalable’ dust, which is covered in AS 3640.

2 OBJECTIVE

The objective of this Standard is to provide a method to assess personal exposure to respirable dust by sampling in a worker’s breathing zone.

Whilst the method only allows for personal sampling, it can also be used to assist in controlling the occupational environment by means of static samples, i.e. samples taken at a fixed location. However, static samples are not to be used to evaluate health risks unless a specific situation or circumstance indicates otherwise.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|---|
| 2162 | Verification and use of volumetric apparatus |
| 2162.1 | Part 1: General—Volumetric glassware |
| 3640 | Workplace atmospheres—Method for sampling and gravimetric determination of inhalable dust |

AS/NZS

- | | |
|------------|---|
| 60079 | Explosive atmospheres |
| 60079.10.1 | Part 10.1: Classification of areas—Explosive gas atmospheres |
| 60079.11 | Part 11: Equipment protection by intrinsic safety ‘i’ |
| 61241 | Electrical apparatus for use in the presence of combustible dust |
| 61241.3 | Part 3: Classification of areas where combustible dusts are or may be present |

ISO

- | | |
|-------|--|
| 7708 | Air quality—Particle size fraction definitions for health-related sampling |
| 15767 | Workplace atmospheres—Controlling and characterizing errors in weighing collected aerosols |
| 20988 | Air quality—Guidelines for estimating measurement uncertainty |

MORRIS, Edwin C. and FEN, Kitty M.K. *The Calibration of Weights and Balances* Monograph 4: Technology Transfer Series, 3rd Edition, National Measurement Institute, November 2003.

NOTE: See Appendix A for bibliography.