Australian Standard™

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

STANDARDS AUSTRALIA

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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
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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—1987, *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.

Since the publication of the previous edition, the International Standards Organization has superseded its technical report with ISO 7708:1995, *Air quality—Particle size fraction definitions for health-related sampling*. The objective of this revision is to align this Standard more closely with international practices in the field of respirable workplace dust measurement.

Sampling devices other than those previously specified have now become available and are included in the Standard.

The Committee is aware of the role that errors, especially in weighing, play in the overall uncertainty of the measurements and has attempted to address the issue in this revision, by reference to a new International Standard, ISO 15767:2003, *Workplace atmospheres—Controlling and characterizing errors in weighing collected aerosols*.

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.

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

1 SCOPE

This Standard sets out a method for 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 circumstances 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

2380 Electrical equipment for explosive atmospheres — Explosion-protection techniques
2380.7 Part 7: Intrinsic safety i

2430 Classification of hazardous areas
2430.1 Part 1: Explosive gas atmospheres

3640 Workplace atmospheres—Method for sampling and gravimetric determination of inhalable dust

AS/NZS
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

MORRIS, Edwin C. and FEN, Kitty M.K. *The Calibration of Weights and Balances* Monograph 4: Technology Transfer Series, National Measurement Laboratory, CSIRO 2001.