Australian/New Zealand Standard™



# Methods for sampling and analysis of ambient air

# Method 10.1: Determination of particulate matter—Deposited matter—Gravimetric method

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EV-007, Methods for Examination of Air, to supersede AS/NZS 3580.10.1:2003.

The objective of this Standard is to provide regulatory and testing bodies with a Standard method for determining deposited matter that rapidly settles from the air. The objective of this revision is to add Appendix A which sets out a procedure for determining the mass deposition rate of metals present in the deposited matter.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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## FOREWORD

Particulate matter sampled by this method is predominantly dust particles which, because of their size, rapidly settle from the air. This dust can be a nuisance by soiling property in the vicinity of its point of emission. Some common sources of such particles are minerals processing, bulk materials handling, surface mining operations, industrial processes, unsealed roads, incineration and natural causes such as wind-blown dust.

This method is used primarily to establish long-term trends and to investigate localized dustfall.

This procedure has been widely used in Australia for over 40 years and, during this time, extensive data has been collected. Data collected using this method is not directly comparable with data obtained by other deposit gauge methods.

Depending on the situation, the metal content of the deposited matter can be of interest. Metals occur naturally in soil and rocks and can be released into the air as particulate matter through weathering, mining activities and wind-blown dust. Anthropogenic sources of particulate metals include minerals processing, incineration and combustion of fuels containing metals. Some metals, upon inhalation or ingestion, can lead to a range of health effects such as cancer, neurotoxicity and reproductive toxicity.

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# METHOD

## 1 SCOPE

This Standard sets out a method for the sampling of particulate matter that is deposited from the atmosphere, and procedures for the gravimetric determination of the mass deposition rate of insoluble solids, ash, combustible matter, soluble solids and total solids from ambient air.

The method provides an estimate of the mean surface concentration of deposited matter settling from the air over a sampling period, typically one month. Particulate matter deposition rates of 0.1 g/m$^2$ month and above may be determined using a monthly sampling period.

The sample obtained by the sampling procedure specified may be subjected to physical or chemical analysis. A method to determine deposition rates for metals present in deposited matter is provided in Appendix A of this Standard.

## 2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

| | | |
|---|---|---|
| AS | | |
| 1152 | | Specification for test sieves |
| 2162 | | Verification and use of volumetric apparatus |
| 2162.1 | Part 1: | General—Volumetric glassware |
| 2164 | | Laboratory glassware—One-mark volumetric flasks |
| 2166 | | Laboratory glassware—One-mark pipettes |
| AS/NZS | | |
| 3580 | | Methods for sampling and analysis of ambient air |
| 3580.1.1 | Part 1.1 | Guide to siting air monitoring equipment |
| 3580.9.15 | Method 9.15 | Determination of suspended particulate matter—Particulate metals high or low volume sampler gravimetric collection—Inductively coupled plasma (ICP) spectrometric method |

## 3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

### 3.1 Ash

The mass of that portion of the insoluble matter remaining after combustion.

### 3.2 Combustible matter

The mass of that portion of the insoluble matter lost during combustion.

### 3.3 Constant mass

Within ±1 mg of the previous mass.

### 3.4 Deposited matter

Particles which are collected in a deposit gauge (see Clause 6.1) and which pass through a 1 mm mesh sieve complying with AS 1152.

### 3.5 Insoluble matter

The mass of the insoluble portion of the deposited matter.