

# Australian/New Zealand Standard™

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## Methods for sampling and analysis of ambient air

### Method 9.9: Determination of suspended particulate matter—PM<sub>10</sub> low volume sampler—Gravimetric method

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AS/NZS 3580.9.9:2006

#### PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EV-007, Methods for Examination of Air as an Australian/New Zealand Standard. This standard method deals with the determination of suspended particulate matter with an equivalent aerodynamic diameter (EAD) of less than approximately 10 µm (PM<sub>10</sub>). This is one in a series of Standards for the determination of particulate matter in ambient air.

The objective of this Standard is to provide regulatory and testing bodies with a standard method for determining suspended particulate matter with an equivalent aerodynamic diameter of less than 10 µm utilizing a low volume sampler and size selective inlet.

AS 2922, *Ambient air—Guide for the siting of sampling units*, is referenced in this Standard. AS 2922 is currently being revised by the Committee and will be renumbered and published as AS/NZS 3580.1.1. When this occurs this Standard will be amended.

The procedure described in this Standard involves batch sampling and the gravimetric determination of PM<sub>10</sub>, and is based on the United States Code of Federal Regulations, Title 40, Chapter 1, Part 50 Appendix J, *Reference method for the determination of particulate matter as PM<sub>10</sub> in the atmosphere*.

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

Suspended particulate matter measured by this method includes particles with an equivalent aerodynamic diameter (EAD) of less than 10 µm, as passed by a size selective inlet (PM<sub>10</sub>). Particles with EAD of 10 µm and less are classified as respirable and hence may affect health. Particles larger than 10 µm generally have nuisance and aesthetic impacts only. PM<sub>10</sub> emission sources include industrial processes, fuel combustion, burning of vegetation, incineration and natural causes such as wind blown dust and salt laden air.

## METHOD

### 1 SCOPE

This Standard sets out the gravimetric determination of PM<sub>10</sub> in ambient air utilizing low volume sequential and non-sequential samplers equipped with size selective inlets. The method provides a measure of mean concentration of PM<sub>10</sub> in units of micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ), normally sampled over a 24 h period.

This method may be used to collect particle samples for subsequent physical or chemical analysis.

NOTE: Sampling is normally of 24 h duration to average out diurnal variations. Provided that the mass of the filter is determined under carefully controlled laboratory conditions, mean concentrations of  $5 \mu\text{g}/\text{m}^3$  (3 L/m sample flow rate) and greater may be determined based on a 24 h sampling period.

### 2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

2922\* Ambient air—Guide for the siting of sampling units

AS ISO/IEC

17025 General requirements for the competence of testing and calibration laboratories

AS/NZS

3760 In-service safety inspection and testing of electrical equipment

ISO

Guide to the expression of uncertainty in measurement (ISO GUM)

EN

12341 Air quality. Determination of the PM<sub>10</sub> fraction of suspended particulate matter. Reference method and field test procedure to demonstrate reference equivalence of measurement methods

US EPA

US Code of Federal Regulations—Environment Protection Agency 40 CFR, Chapter I, Part 50, Appendix J and Parts 53.4 to 53.43 inclusive

NATA

Technical Note 8—In-situ calibration of barometers

Technical Note 13—Users check of balance calibration

Technical Note 19—Liquid-in-glass thermometers—Selection, use and calibration checks

### 3 DEFINITIONS

For the purpose of this Standard the following definitions apply:

#### 3.1 Equivalent aerodynamic diameter (EAD)

The diameter of a spherical particle of unit density ( $1 \text{ g}/\text{m}^3$ ) which exhibits the same aerodynamic behaviour as the particle in question.

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\* AS 2922 is being revised. It is proposed to be re-numbered as AS/NZS 3580.1.1.