

Australian Standard™

**Workplace air quality—Sampling and
analysis of volatile organic compounds
by solvent desorption/gas
chromatography**

Part 1: Pumped sampling method

This Australian Standard was prepared by Committee CH-031, Methods for the Examination of Workplace Atmospheres. It was approved on behalf of the Council of Standards Australia on 3 November 2003 and published on 24 December 2003.

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
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**Workplace air quality—Sampling and
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PREFACE

This Standard was prepared by the Standards Australia Committee CH-031, Methods for Examination of Workplace Atmospheres to supersede, in part, AS 2986—1987, *Workplace atmospheres—Organic vapours—Sampling by solid absorption techniques*.

This Standard is identical with and has been reproduced from ISO 16200-1:2001, *Workplace air quality—Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography*, Part 1: *Pumped sampling method*.

The objective of this Standard is to provide a method for sampling, using a personal pump and analysis of organic compounds by gas chromatography in workplace atmospheres.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number appears on the cover and title page while the International Standard number appears only on the cover.
- (b) In the source text, ‘this part of ISO 16200’ should read ‘this Australian Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

None of the documents referenced in this Standard have been adopted as Australian Standards.

This Standard is Part 1 of the following series:

AS

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|--------|--|
| 2986 | Workplace air quality—Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography |
| 2986.1 | Part 1: Pumped sampling method |
| 2986.2 | Part 2: Diffusive sampling method |

The Committee acknowledges advice from NATA (National Association of Testing Authorities) that, in Australia, some clauses in this Standard, which are given as advisory, are mandatory requirements for laboratories seeking NATA accreditation. Specifically:

- (i) Clause 4.4: Traceability of calibration blend solutions to national or international Standards is a NATA requirement.
- (ii) Clause 6: Preparation of field blanks is a NATA requirement.
- (iii) Clause 10: Estimations of uncertainty are required by NATA to be prepared in accordance with the principles of ISO GUM.*

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

* ‘Guide to the Expression of Uncertainty in Measurement’ issued by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML, Geneva, 1993.

CONTENTS

1	Scope	1
2	Normative references	2
3	Principle.....	2
4	Reagents and materials	2
5	Apparatus	4
6	Sampling.....	6
7	Procedure	7
8	Calculations.....	8
9	Interferences	9
10	Precision and bias	9
11	Storage and transport	9
12	Test report	10
13	Quality control.....	10
Annex A (informative) Description of sorbent types		23
Annex B (informative) Equivalence of gas chromatographic stationary phases		24
Annex C (informative) Determination of breakthrough volume		25
Bibliography		27

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AUSTRALIAN STANDARD

Workplace air quality—Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography

Part 1:

Pumped sampling method

1 Scope

This part of ISO 16200 gives general guidance for the sampling and analysis of volatile organic compounds (VOCs) in air by solvent desorption/gas chromatography using pumped sampling.

This part of ISO 16200 is applicable to a wide range of VOCs, including hydrocarbons, halogenated hydrocarbons, esters, glycol ethers, ketones and alcohols. A number of sorbents are recommended for the sampling of these VOCs, each sorbent having a different range of applicability. However, activated coconut shell charcoal is frequently used. Very polar compounds may require derivatization; very low boiling compounds will only be partially retained by the sorbents and can only be estimated qualitatively. Semi-volatile compounds will be fully retained by the sorbents, but may only be partially recovered.

The upper limit of the useful range is set by the sorptive capacity of the sorbent used and by the linear dynamic range of the gas chromatograph column and detector or by the sample-splitting capability of the analytical instrumentation used. The lower limit of the useful range depends on the noise level of the detector and on blank levels of analyte and/or interfering artefacts on the sorbent traces in the desorption solvent. Artefacts are typically subnanogram for activated charcoal, but higher levels of aromatic hydrocarbons have been noted in some batches.

The concentration range for which this part of ISO 16200 is valid for the measurement of airborne vapours of VOCs is dependent on the volume sampled. For example, for a 10-litre sample of air, the range is approximately 1 mg/m³ to 1000 mg/m³ individual organic compound. For a 1-litre sample of air, the range is approximately 10 mg/m³ to 10 000 mg/m³ individual organic compound, and *pro rata*.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 16200. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 16200 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

EN 1232, *Workplace atmospheres — Pumps for personal sampling of chemical agents — Requirements and test methods*

EN 1540, *Workplace atmospheres — Terminology*