

This is a preview of "ISO 8518:2022". [Click here to purchase the full version from the ANSI store.](#)

Third edition
2022-10

Workplace air — Determination of particulate lead and lead compounds — Flame and electrothermal atomic absorption spectrometric methods

*Air des lieux de travail — Dosage du plomb particulaire et des
composés particulaires du plomb — Méthode par spectrométrie
d'absorption atomique dans la flamme et méthode par spectrométrie
d'absorption avec atomisation électrothermique*



Reference number
ISO 8518:2022(E)

© ISO 2022



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO 8518:2022". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

| | |
|--|-----------|
| Foreword..... | v |
| Introduction..... | vi |
| 1 Scope..... | 1 |
| 2 Normative references..... | 1 |
| 3 Terms and definitions..... | 2 |
| 4 Principle..... | 2 |
| 5 Reactions..... | 3 |
| 6 Requirement..... | 3 |
| 7 Reagents..... | 3 |
| 8 Apparatus..... | 5 |
| 9 Occupational exposure assessment..... | 8 |
| 9.1 Assessment strategy..... | 8 |
| 9.2 Measurement strategy..... | 8 |
| 9.2.1 General..... | 8 |
| 9.2.2 Personal sampling..... | 8 |
| 9.2.3 Static (area) sampling..... | 8 |
| 9.3 Selection of measurement conditions and measurement pattern..... | 8 |
| 9.3.1 General..... | 8 |
| 9.3.2 Screening measurements of time-weighted average concentration and worst-case measurements..... | 9 |
| 9.3.3 Screening measurements of variation of concentration in either time or space, or both..... | 9 |
| 9.3.4 Measurements for comparison with limit values and periodic measurements..... | 9 |
| 10 Sampling..... | 9 |
| 10.1 Preliminary considerations..... | 9 |
| 10.1.1 Selection and use of samplers..... | 9 |
| 10.1.2 Sampling period..... | 9 |
| 10.1.3 Temperature and pressure effects..... | 10 |
| 10.2 Preparation of sampling equipment..... | 10 |
| 10.2.1 Cleaning of samplers..... | 10 |
| 10.2.2 Loading the samplers with sampling substrate..... | 10 |
| 10.2.3 Setting the volumetric flow rate..... | 10 |
| 10.2.4 Field blanks..... | 11 |
| 10.3 Sampling position..... | 11 |
| 10.3.1 Personal sampling..... | 11 |
| 10.3.2 Static (area) sampling..... | 11 |
| 10.4 Collection of samples..... | 11 |
| 10.5 Transportation..... | 12 |
| 10.6 Storage..... | 12 |
| 11 Analysis..... | 12 |
| 11.1 Cleaning of glassware and plasticware..... | 12 |
| 11.2 Preparation of sample and blank solutions..... | 13 |
| 11.2.1 General..... | 13 |
| 11.2.2 Selection of sample dissolution method..... | 13 |
| 11.2.3 Hot plate digestion method..... | 13 |
| 11.2.4 Microwave assisted digestion method..... | 13 |
| 11.2.5 Ultrasonic extraction method..... | 14 |
| 11.3 Instrumental analysis..... | 15 |
| 11.3.1 Selection of analytical line..... | 15 |
| 11.3.2 Flame atomic absorption spectrometry..... | 15 |

This is a preview of "ISO 8518:2022". [Click here to purchase the full version from the ANSI store.](#)

| | | |
|---|--|-----------|
| 11.3.3 | Electrothermal atomic absorption spectrometry..... | 16 |
| 11.4 | Estimation of the instrumental detection limit..... | 18 |
| 11.5 | Estimation of the method detection limit and method quantification limit..... | 18 |
| 11.6 | Quality control..... | 18 |
| 11.6.1 | General..... | 18 |
| 11.6.2 | Reagent blanks and media blanks..... | 19 |
| 11.6.3 | Spiked samples and spiked duplicate samples..... | 19 |
| 11.6.4 | Certified reference materials..... | 19 |
| 11.6.5 | External quality assessment..... | 19 |
| 12 | Expression of results..... | 19 |
| 12.1 | Calculation..... | 19 |
| 12.2 | Method performance..... | 20 |
| 12.2.1 | Sample collection..... | 20 |
| 12.2.2 | Hot plate digestion and flame atomic absorption spectrometry..... | 20 |
| 12.2.3 | Microwave assisted digestion and flame atomic absorption spectrometry..... | 20 |
| 12.2.4 | Ultrasonic extraction and flame atomic absorption spectrometry..... | 20 |
| 12.2.5 | Hot plate digestion and electrothermal atomic absorption spectrometry..... | 20 |
| 12.2.6 | Microwave assisted digestion and electrothermal atomic absorption spectrometry..... | 20 |
| 12.2.7 | Ultrasonic extraction and electrothermal atomic absorption spectrometry..... | 21 |
| 13 | Special cases..... | 21 |
| 14 | Test report..... | 21 |
| Annex A (informative) Guidance on filter selection..... | | 23 |
| Annex B (informative) Sampler wall deposits..... | | 26 |
| Annex C (normative) Temperature and pressure correction..... | | 28 |
| Bibliography..... | | 30 |

This is a preview of "ISO 8518:2022". Click here to purchase the full version from the ANSI store.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 2, *Workplace atmospheres*.

This third edition cancels and replaces the second edition (ISO 8518:2001), which has been technically revised.

The main changes are as follows:

- a new [Annex B](#) (informative) has been added concerning sampler wall deposits;
- references and definitions have been updated;
- additional editorial changes have been made.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The health of workers in many industries, for example, mining, metal refining, battery manufacture, construction, is at risk through exposure by inhalation of particulate lead and lead compounds. Industrial hygienists and other public health professionals need to determine the effectiveness of measures taken to control workers' exposure, and this is generally achieved by making workplace air measurements. This document provides a method for making valid exposure measurements for lead. It will be of benefit to:

- agencies concerned with health and safety at work;
- industrial hygienists and other public health professionals;
- analytical laboratories;
- industrial users and workers of metals and metalloids, etc.

During the development of this document, it has been assumed that the execution of its provisions and the interpretation of the results obtained is entrusted to appropriately qualified and experienced people.