

INTERNATIONAL
STANDARD

ISO
9855

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**Ambient air — Determination of the
particulate lead content of aerosols
collected on filters — Atomic absorption
spectrometric method**

*Air ambiant — Dosage du plomb dans les particules d'aérosol collectées
sur des filtres — Méthode par spectrométrie d'absorption atomique*



Reference number
ISO 9855:1993(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9855 was prepared by Technical Committee ISO/TC 146, *Air quality*, Sub-Committee SC 3, *Ambient atmospheres*.

Annexes A, B and C form an integral part of this International Standard.

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Ambient air — Determination of the particulate lead content of aerosols collected on filters — Atomic absorption spectrometric method

1 Scope

This International Standard specifies a method based on acid digestion and atomic absorption spectrometry for the chemical analysis of lead samples collected on filters from ambient air. The method is applicable to ambient air samples with particulate lead contents, such that the amount of deposited particulate lead collected on the filter of the sampling equipment is greater than 1 µg if the final determination is made by flame atomic absorption spectrometry. Final determination by graphite furnace atomic absorption spectrometry allows measurement of quantities of less than 1 µg, but is only applicable after experimental validation of detection limits.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 648:1977, *Laboratory glassware — One-mark pipettes*.

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks*.

ISO 4793:1980, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*.

ISO 6879:1983, *Air quality — Performance characteristics and related concepts for air quality measuring methods*.

ISO 6955:1982, *Analytical spectroscopic methods — Flame emission, atomic absorption, and atomic fluorescence — Vocabulary*.

3 Principle

Particulate material collected on a filter is digested with acid. Any lead present is solubilized and the sample solution analysed by atomic absorption spectrometry.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity (as in 4.1). It is essential that the lead contents of reagents are constant so that reproducible blank values can be obtained.

4.1 Distilled or deionized water, with a lead content less than 0,01 µg/ml and an electrical conductivity less than 0,2 mS/m (2 µS/cm), or an electrical resistivity greater than 5 kΩ·m.

4.2 Nitric acid (HNO₃), concentrated, $\rho_{20} = 1,42$ g/ml, redistilled with a lead content less than 0,01 µg/ml.

4.3 Nitric acid, dilute, approximately 0,1 mol/l.

Add 10 ml of concentrated nitric acid (4.2) to 500 ml of water (4.1) and dilute to 1 litre with water (4.1).

4.4 Lead standard solution, corresponding to 1 000 µg of Pb per millilitre.

Use commercial standard solutions at a concentration of 1 000 µg/ml, or prepare a lead standard solution as follows.

Dissolve 1,598 g ± 0,001 g of lead nitrate [Pb(NO₃)₂] previously dried to constant mass at 110 °C and