
**Stationary source emissions — Manual
determination of mass concentration of
particulate matter**

*Émissions de sources fixes — Détermination manuelle de la
concentration en masse de poussières*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 9096 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 1, *Stationary source emissions*.

This second edition cancels and replaces the first edition (ISO 9096:1992), which has been technically revised.

Introduction

Close liaison and cooperation between ISO/TC 146/SC 1 and CEN/TC 264 has resulted in the preparation of this International Standard (ISO 9096), ISO 12141 and European Standard EN 13824-1. This International Standard is similar to EN 13284-1 with additional emphasis given on the use of high-volume sampling techniques. A representative, integrated sample is extracted from the flue gas and particulate matter entrained in the gas sample is separated by a filter. The pre-weighed filter is subsequently dried and weighed. A relative increase in the mass is attributed to the collection of particulate matter on the filter.

To meet the specifications of this International Standard, the particulate sample must be weighed to a specified level of accuracy. This level of accuracy is achieved by:

- a) exercising extreme care in weighing, in accordance with the procedures of this International Standard;
- b) extending the sampling time at conventional sampling rates;
- c) sampling at higher rates for conventional sampling times (high-volume sampling);
- d) recovering all dust upstream of the filter.

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Stationary source emissions — Manual determination of mass concentration of particulate matter

1 Scope

This International Standard describes a reference method for the measurement of particulate matter (dust) concentration in waste gases of concentrations from 20 mg/m³ to 1000 mg/m³ under standard conditions.

This International Standard is applicable to the calibration of automated monitoring systems (AMS). If the emission gas contains unstable, reactive or semi-volatile substances, the measurement will depend on the filtration temperature. In-stack methods may be more applicable than out-stack methods for the calibration of automated monitoring systems.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5725 (all parts), *Accuracy (trueness and precision) of measurement methods and results*

ISO 10780, *Stationary source emissions — Measurement of velocity and volume flowrate of gas streams in ducts*

ISO 12141, *Stationary source emissions — Determination of mass concentration of particulate matter (dust) at low concentrations — Manual gravimetric method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

particulate matter

dust

particles, of any shape, structure or density, dispersed in the gas phase under the sampling conditions

NOTE 1 In the method described, all the compounds that may be collected by filtration under specified conditions after representative sampling of the gas to be analysed, and which remain upstream of the filter and on the filter after drying under specified conditions, are considered to be dust (or particulate matter). However, for the purposes of some national standards, the definition of particulate matter may extend to condensibles or reaction products collected under specified conditions (e.g. temperatures lower than the flue gas temperature).

NOTE 2 This method restricts the definition of particulate matter to that material collected in the sampling system on and before a filter, under specified temperature conditions. Procedures for the measurement of secondary particulate matter (condensable materials) formed and collected after the filter are not within the scope of this International Standard.