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Environmental tobacco smoke — Estimation of its contribution to respirable suspended particles — Determination of particulate matter by ultraviolet absorbance and by fluorescence

*Fumée de tabac ambiante — Estimation de sa contribution aux particules
respirables suspendues dans l'air — Détermination de la matière
particulaire par absorption dans l'ultraviolet et par fluorescence*



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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15593 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*.

Annex A of this International Standard is for information only.

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Introduction

Environmental tobacco smoke (ETS) is an aerosol consisting of vapour and particulate phase components. Due to the nature of the two aerosol phases, they rarely correlate well, and an accurate assessment of ETS levels in indoor air requires determining good tracers of both phases. Among the attributes of an ideal ETS tracer, one critical characteristic is that the tracer should "remain in a fairly consistent ratio to the individual contaminant of interest or category of contaminants of interest (e.g. suspended particulates) under a range of environmental conditions" (see reference [1]).

NOTE The bibliography gives full references to the literature cited. References to the literature are given in the text for information for the user of this International Standard.

Ultraviolet particulate matter (UVP) and fluorescent particulate matter (FPM) fulfil this requirement, staying in a constant ratio to respirable suspended particles (RSP) from tobacco smoke under a variety of ventilation conditions and sampling durations. In contrast, nicotine (a component of the ETS aerosol vapour phase) does not remain in a consistent ratio to ETS particulate matter (ETS-PM) (see reference [2]).

RSP, a necessary indicator of overall air quality, emanates from many sources, such as combustion processes (including tobacco smoke), atmospheric dust, talc, insecticide dusts, viruses, bacteria, etc. (see reference [3]). Consequently, RSP is an inappropriate tracer of ETS levels present in any environment. Studies have shown that in most indoor spaces where smoking is permitted without restriction, 50 % or less of the RSP (on average) is attributable to tobacco smoke (see references [4] to [7]). The test methods described in this International Standard have been used effectively to reduce the uncontrollable bias inherent in the use of RSP as a tracer of ETS (see references [4] to [6], and [8] to [13]).

Because the measured spectral properties are not unique to ETS-PM, these methods will always be a conservative measure (i.e. an overestimation) of the contribution of ETS to indoor RSP. Combustion sources are known to add significantly to the UVP measure (see reference [14]). FPM is considered to be less prone to, but not free from, interferences. As a result, these methods provide only an indication, and not the absolute level, of the contribution of ETS to indoor RSP due to the potential presence of unquantifiable interferences.