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Indoor air —

Part 7:
Sampling strategy for determination of airborne asbestos fibre concentrations

Air intérieur —

Partie 7: Stratégie d'échantillonnage pour la détermination des concentrations en fibres d'amiante en suspension dans l'air

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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 16000-7 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 6, *Indoor air*.

ISO 16000 consists of the following parts, under the general title *Indoor air* :

⎯ *Part 1: General aspects of sampling strategy*

⎯ *Part 2: Sampling strategy for formaldehyde*

⎯ *Part 3: Determination of formaldehyde and other carbonyl compounds — Active sampling method*

⎯ *Part 4: Determination of formaldehyde — Diffusive sampling method*

⎯ *Part 5: Sampling strategy for volatile organic compounds (VOCs)*

⎯ *Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas-chromatography using MS/FID*

⎯ *Part 7: Sampling strategy for determination of airborne asbestos fibre concentrations*

⎯ *Part 8: Determination of local mean ages of air in buildings for characterizing ventilation conditions*

⎯ *Part 9: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test chamber method*

⎯ *Part 10: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test cell method*

⎯ *Part 11: Determination of the emission of volatile organic compounds from building products and furnishing —Sampling, storage of samples and preparation of test specimens*

⎯ *Part 12: Sampling strategy for polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polycyclic aromatic hydrocarbons (PAHs)*

⎯ *Part 13: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) — Collection on sorbent-backed filters*

— *Part 14: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) — Extraction, clean-up and analysis by high-resolution gas chromatography/mass spectrometry*

— *Part 15: Sampling strategy for nitrogen dioxide (NO$_2$)*

— *Part 16: Detection and enumeration of moulds — Sampling by filtration*

— *Part 17: Detection and enumeration of moulds — Culture-based method*

The following parts are under preparation:

— *Part 18: Detection and enumeration of moulds — Sampling by impaction*

— *Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials*

— *Part 24: Performance test for evaluating the concentration reduction of volatile organic compounds and carbonyl compounds except formaldehyde by sorptive building materials*

— *Part 25: Determination of the emission of semi volatile organic compounds for building products — Micro chamber method*

The following parts are planned:

— *Part 19: Sampling strategy for moulds*

— *Part 20: Detection and enumeration of moulds — Sampling from house dust*

— *Part 21: Detection and enumeration of moulds — Sampling from materials*

— *Part 22: Detection and enumeration of moulds — Molecular methods*

— *Part 26: Road vehicle interior test stand — Determination of VOC, SVOC and carbonyls including formaldehyde in car interiors*

Furthermore, two International Standards, ISO 16017-1 on pumped sampling and ISO 16017-2 on diffusive sampling, focus on volatile organic compound (VOC) measurements.

Introduction

Measurements of airborne asbestos fibre concentrations in indoor atmospheres are made for several reasons related to short-term or long-term exposure of building occupants to asbestos. One application of such measurements is to ensure that airborne asbestos fibres dispersed in areas of a building that are undergoing asbestos abatement do not result in unacceptable exposures of occupants in other areas of the building. After asbestos abatement is completed, measurements are made prior to removal of containment barriers and before safety precautions are discontinued to determine whether any residual asbestos that may remain in the abated area could give rise to unacceptable airborne asbestos exposures when the areas are re-occupied.

The characterization and assessment of ambient air at a fixed position, whether in a building or outside, is normally based on a series of measurements made over a long period of time, generally months or years. However, the release of asbestos fibres into ambient air is not constant and human, or in some cases animal, activity will result in short-term release episodes. Maintenance activity in particular will disturb asbestos-containing materials and settled dust in buildings. Control and monitoring of these activities will determine the long-term exposure levels [1][2]. Workplace atmospheres are also assessed by a series of repeated measurements, the number of measurements depending on the difference between the measured value and the control limit.

In contrast to the strategy used for assessment of long-term asbestos fibre concentrations and personal exposures, the assessment of asbestos fibre concentrations in connection with asbestos abatement measures is nearly always based on a set of measurements made at one time. This special situation needs to be taken into account, both when planning the measurements, and during collection of the air samples. It is not possible to predict long-term changes of airborne asbestos fibre concentrations resulting from any deterioration of asbestos-containing material or the type of usage of the rooms. However, through the use of an appropriate sampling strategy and sampling technique, and by taking extreme, but realistic, conditions into consideration, it is possible to simulate and estimate the short-term maximum asbestos fibre concentrations that can occur.

The sampling strategy described in this part of ISO 16000 is based on VDI 3492 [3].