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Workplace air — Analysis of respirable crystalline silica by X-ray diffraction —

Part 1: Direct-on-filter method

Air des lieux de travail — Fraction alvéolaire de la silice cristalline par diffraction de rayons X —

Partie 1: Méthode directe d'analyse sur filtre



Reference number
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Foreword

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 146, *Air quality,* Subcommittee SC 2, *Workplace atmospheres.*

ISO 16258 consists of the following parts, under the general title *Workplace air — Analysis of respirable crystalline silica by X-ray diffraction:*

— *Part 1: Direct-on-filter method*

— *Part 2: Method by indirect analysis*

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Introduction

Respirable crystalline silica (RCS) is a hazard to the health of workers in many industries through exposure by inhalation. Industrial hygienists and other public health professionals need to determine the effectiveness of measures taken to control workers' exposure. The collection of samples of air during a work activity and then measuring the amount of respirable crystalline silica are often done to assess an individual's exposure, the effectiveness of controls or their respiratory protection. X-ray diffraction (XRD) analysis of crystalline silica in a sample of respirable dust collected on a filter is the principle technique employed in many countries to measure and estimate exposure to RCS. X-ray diffraction is able to clearly distinguish the polymorphs of crystalline silica.

This part of ISO 16258 specifies the procedure for a method of analysing RCS directly on the air sample filter. A specific requirement of this method is that the filter from the sampling apparatus has a diameter of 25 mm. The method also discusses optimum instrumental parameters, for various types of detectors in common use at the time of publication. This part of ISO 16258 is to be used in conjunction with ISO 24095 which promotes best practice for these analyses.

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Workplace air — Analysis of respirable crystalline silica by X-ray diffraction —

Part 1: Direct-on-filter method

1 Scope

This part of ISO 16258 specifies the analysis of respirable crystalline silica (RCS) in samples of air collected on 25 mm-filters by X-ray diffraction, when using an analytical approach where the dust on the air sample filter is directly analysed by the instrument. This part of ISO 16258 includes information on the instrumental parameters, sensitivity of different sampling apparatus, uses of different filters and correction for absorption effects. In this part of ISO 16258, the expression RCS includes the most common polymorphs quartz and cristobalite. The less common polymorphs of crystalline silica, such as tridymite, are not included within the scope of this part of ISO 16258 because a standard reference material is not available. Under certain circumstances (i.e. low filter dust loads, low silica content), the analytical approach described in this method may not fulfil the expanded uncertainty requirements of EN 482.[5] Guidance for calculation of uncertainty for measurements of RCS is given in ISO 24095.

2 Normative references

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

ISO 7708, *Air quality — Particle size fraction definitions for health-related sampling*

ISO 13137,*Workplace atmospheres — Pumps for personal sampling of chemical and biological agents — Requirements and test methods*

ISO 15767, *Workplace atmospheres — Controlling and characterizing uncertainty in weighing collected aerosols*

ISO 24095,*Workplace air — Guidance for the measurement of respirable crystalline silica*

3 Terms and definitions

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

3.1 General definitions

3.1.1
airborne particles
fine matter, in solid or liquid form, dispersed in air

[SOURCE: EN 1540]

Note 1 to entry: Smoke, fume, mist and fog consist of airborne particles.

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