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BS ISO 22262-2:2014



BSI Standards Publication

Air quality — Bulk materials

Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods

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**Air quality — Bulk materials —
Part 2:
Quantitative determination of
asbestos by gravimetric and
microscopical methods**

Qualité de l'air — Matériaux solides —

*Partie 2: Dosage quantitatif de l'amiante en utilisant les méthodes
gravimétrique et microscopique*



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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	6
5 Determination of analytical requirements	6
6 Range	7
7 Limit of quantification	7
8 Principle	8
9 Safety precautions	8
10 Apparatus	8
11 Reagents	10
12 Sample size and homogeneity	10
12.1 Sample size.....	10
12.2 Representative sample.....	10
13 Methods for gravimetric matrix reduction	11
13.1 General.....	11
13.2 Data recording.....	11
13.3 Selection and pre-treatment of a representative sub-sample.....	13
13.4 Removal of organic materials by ashing.....	14
13.5 Acid treatment and sedimentation procedures.....	15
14 Procedures for quantification of asbestos in the final residue from gravimetric matrix reduction	18
14.1 General.....	18
14.2 Examination of the residue on the filter and selection of the appropriate procedure.....	19
15 Determination of asbestiform amphibole in vermiculite	25
15.1 General.....	25
15.2 Required size of sample for analysis.....	26
15.3 Sample pre-treatment.....	26
15.4 Separation of amphibole and measurement of the amphibole mass fraction.....	28
16 Determination of asbestos in talc	29
16.1 General.....	29
16.2 Determination of chrysotile in talc.....	29
16.3 Determination of amphibole in talc.....	29
17 Determination of compliance with legislative control limits	30
17.1 General.....	30
17.2 Gravimetry alone.....	30
17.3 Gravimetry combined with visual estimation.....	30
17.4 Gravimetry combined with point counting.....	30
17.5 Quantitative SEM or TEM fibre counting.....	32
18 Test report	32
Annex A (normative) Types of commercial asbestos-containing materials and optimum analytical procedures	34
Annex B (normative) Required centrifuge times for separation of amphibole in heavy liquid	42

This is a preview of "BS ISO 22262-2:2014". [Click here to purchase the full version from the ANSI store.](#)

Annex C (normative) Example of test report	44
Bibliography	46

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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.

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 3, *Ambient atmospheres*.

ISO 22262 consists of the following parts, under the general title *Air quality — Bulk materials*:

- *Part 1: Sampling and qualitative determination of asbestos in commercial bulk materials*
- *Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods*

The following part is under preparation:

- *Part 3: Quantitative determination of asbestos by X-ray diffraction method*

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Introduction

In the past, asbestos was used in a wide range of products. Materials containing high proportions of asbestos were used in buildings and in industry for fireproofing, thermal insulation and acoustic insulation. Asbestos was also used to reinforce materials, to improve fracture and bending characteristics. A large proportion of the asbestos produced was used in asbestos-cement products. These include flat sheets, tiles and corrugated sheets for roofing, pipes and open troughs for collection of rainwater, and pressure pipes for supply of potable water. Asbestos was also incorporated into products such as decorative coatings and plasters, glues, sealants and resins, floor tiles, gaskets and road paving. In some products asbestos was incorporated to modify rheological properties, for example in the manufacture of ceiling tile panels and oil drilling muds.

Three varieties of asbestos found extensive commercial application. Chrysotile accounted for approximately 95 % of consumption, and therefore this is the variety that is encountered most frequently during analysis of samples. Amosite and crocidolite accounted for almost all of the balance, with a very small contribution from anthophyllite. Amosite was generally used as fireproofing or in thermal insulation products. Crocidolite was also used as fireproofing and thermal insulation products, but because it is highly resistant to acids, it also found application as a reinforcing fibre in acid containers such as those used for lead-acid batteries, and in some gaskets. Materials containing commercial anthophyllite are relatively rare, but it also has been used as a filler and reinforcing fibre in composite materials, and as a filtration medium. Tremolite asbestos and actinolite asbestos were not extensively used commercially, but they sometimes occur as contamination of other commercial minerals. Richterite asbestos and winchite asbestos occur at mass fractions between 0,01 % and 6 % in vermiculite formerly mined at Libby, Montana, USA. Vermiculite from this source was widely distributed and is often found as loose fill insulation and as a constituent in a range of construction materials and fireproofing.

While the asbestos mass fraction in some products can be very high and in some cases approach 100 %, in other products the mass fractions of asbestos used were significantly lower and often between 1 % and 15 %. In some ceiling tile panels, the mass fraction of asbestos used was close to 1 %. There are only a few known materials in which the asbestos mass fraction used was less than 1 %. Some adhesives, sealing compounds and fillers were manufactured in which asbestos mass fractions were lower than 1 %. There are no known commercially manufactured materials in which any one of the common asbestos varieties (chrysotile, amosite, crocidolite or anthophyllite) was intentionally added at mass fractions lower than 0,1 %.

ISO 22262-1 specifies procedures for collection of samples and qualitative analysis of commercial bulk materials for the presence of asbestos. A visual estimate of the asbestos mass fraction may also be made. While it is recognized that the accuracy and reproducibility of such estimates is very limited, for many of the types of materials being analysed these estimates are sufficient to establish that the mass fraction of asbestos in a manufactured product is, without doubt, well above any of the regulatory limits.

Because of the wide range of matrix materials into which asbestos was incorporated, microscopy alone cannot provide reliable analyses of all types of asbestos-containing materials in untreated samples. This part of ISO 22262 extends the applicability and limit of detection of microscopical analysis by the use of simple procedures such as ashing, acid treatment, sedimentation and heavy liquid density separation prior to microscopical examination.

A prerequisite for use of this part of ISO 22262 and subsequent parts of ISO 22262 is that the sample shall have been examined ISO 22262-1. ISO 22262 is for application by knowledgeable analysts who are familiar with the analytical procedures specified.^{[7][8][9][10]}

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Air quality — Bulk materials —

Part 2:

Quantitative determination of asbestos by gravimetric and microscopical methods

1 Scope

This part of ISO 22262 specifies procedures for quantification of asbestos mass fractions below approximately 5 %, and quantitative determination of asbestos in vermiculite, other industrial minerals and commercial products that incorporate these minerals.

This part of ISO 22262 is applicable to the quantitative analysis of:

- a) any material for which the estimate of asbestos mass fraction obtained using ISO 22262-1 is deemed to be of insufficient precision to reliably classify the regulatory status of the material, or for which it is considered necessary to obtain further evidence to demonstrate the absence of asbestos;
- b) resilient floor tiles, asphaltic materials, roofing felts and any other materials in which asbestos is embedded in an organic matrix;
- c) wall and ceiling plasters, with or without aggregate;
- d) mineral products such as wollastonite, dolomite, calcite, talc or vermiculite, and commercial products containing these minerals.

This part of ISO 22262 is primarily intended for application to samples in which asbestos has been identified at estimated mass fractions lower than approximately 5 % by weight. It is also applicable to samples that may contain asbestos at low mass fractions incorporated into matrix material such that microscopical examination of the untreated sample is either not possible or unreliable. An annex gives recommendations for the analysis of each type of material that may contain asbestos.

It is not the intent of ISO 22262 to provide instruction in the fundamental microscopical and analytical techniques.

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 22262-1:2012, *Air quality — Bulk materials — Part 1: Sampling and qualitative determination of asbestos in commercial bulk materials*

ISO 13794:1999, *Ambient air — Determination of asbestos fibres — Indirect-transfer transmission electron microscopy method*

3 Terms and definitions

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