Workplace atmospheres - Measurement of the dustiness of bulk materials - Requirements and reference test methods

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 15051:2006 sisaldab Euroopa standardi EN 15051:2006 ingliskeelset teksti. Käesolev dokument on jõustatud 29.05.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 15051:2006 consists of the English text of the European standard EN 15051:2006. This document is endorsed on 29.05.2006 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This document specifies the two reference test apparatuses and reference test methods for the reproducible production of dust from a bulk material under standard conditions, and the measurement of the inhalable, thoracic and respirable fractions of this dust, with reference to the existing CEN standards, where relevant (see Clause 6).	**Scope:** This document specifies the two reference test apparatuses and reference test methods for the reproducible production of dust from a bulk material under standard conditions, and the measurement of the inhalable, thoracic and respirable fractions of this dust, with reference to the existing CEN standards, where relevant (see Clause 6).

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Workplace atmospheres - Measurement of the dustiness of bulk materials - Requirements and reference test methods

Atmosphère des lieux de travail - Mesure du pouvoir de resuspension des matériaux pulvérulents en vrac - Exigences et méthodes d'essai de référence

Arbeitsplatzatmosphäre - Messung des Staubungsverhaltens von Schüttgütern - Anforderungen und Referenzprüfverfahren

This European Standard was approved by CEN on 16 March 2006.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This document (EN 15051:2006) has been prepared by Technical Committee CEN/TC 137 “Assessment of workplace exposure to chemical and biological agents”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The control of dust emissions during the handling and transportation of materials is an important consideration in the design and operation of many industrial processes. Excessive airborne dust levels in workplaces are undesirable for a number of reasons:

a) can cause adverse health effects to the work force;
b) control can involve the use of costly ventilation and filtration systems;
c) can be costly in terms of lost product;
d) can contaminate machinery and products.

It is advantageous, therefore, for occupational hygienists and process engineers to have accurate information about the propensity of materials to produce airborne dust (the '*dustiness*' of the material) so that risks can be evaluated, controlled and minimised.

No single method of dustiness testing is likely to represent and reproduce the various types of processing and handling used in industry. Therefore a number of dustiness testing methods are in use in different industries. Different methods use different test apparatus and measuring principles, and express results in different ways. Methods that do not separate the dust cloud produced into the three health-related size fractions - inhalable, thoracic and respirable dust - can serve the needs of manufacturing industry for process and batch control, but give limited information on the health hazard due to the dustiness of the material.

Dustiness is a relative term and the measurement obtained will depend on the test apparatus used, the properties of the dust and various environmental variables. The test and the variables therefore need to be closely specified to ensure reproducibility. Recognising the above it was concluded that there was a need for standardised reference methods to measure the dustiness of bulk materials, based on the biologically relevant aerosol fractions defined in EN 481.

This document establishes reference test methods that classify the dustiness, in terms of health-related fractions, of bulk solid materials. The dustiness classification is intended to provide users (e.g. manufacturers, producers, occupational hygienists and workers) with information on the potential for dust emissions when the material is handled or processed in workplaces. It provides the manufacturers of materials with information that can help to improve their products. It allows the users of the materials to assess the effects of pre-treatments, and also to select less dusty products, if available. Although this document does not discuss the analysis of dust released from bulk materials (except in terms of health-related fractions), the test method produces samples with the potential for chemical analysis of the contents.

This document also provides reference test methods to which users of alternative test methods on dustiness can compare their own measurements. A standardised test of equivalence is used to test whether the alternative test method is capable of reproducing the dustiness classifications of the reference test methods, for a range of standardised test dusts. If the requirements for equivalence are satisfied the alternative test method can be used to classify the dustiness of bulk materials.

This document was developed based on the results of the European project SMT4-CT96-2074 Development of a Method for Dustiness Testing (see [1]). This project investigated the dustiness of 12 materials, with the intention to test as wide a range of materials as possible, i.e. magnitude of dustiness, industrial sectors, chemical composition and particle size distribution.

1 Scope

This document specifies the two reference test apparatuses and reference test methods for the reproducible production of dust from a bulk material under standard conditions, and the measurement of the inhalable, thoracic and respirable fractions of this dust, with reference to the existing CEN standards, where relevant (see Clause 6).

This document specifies the environmental conditions, the sample handling and analysis procedures and the method of calculating and presenting the results. A classification scheme for dustiness is specified, to provide a standardised way to express and communicate the results to users of the bulk materials.

In Annex D, a test method is described that enables dustiness information produced by test methods other than these two reference test methods to be related to that produced using these standard reference test methods.

This document is applicable to powdered, granular or pelletised materials. A standard sample volume is used.

This document is not applicable to test the dust released when solid materials are mechanically reduced (e.g. cut, crushed) or to test handling procedures for the materials.

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.

EN 1232, *Workplace atmospheres - Pumps for personal sampling of chemical agents - Requirements and test methods*

EN 13205, *Workplace atmospheres – Assessment of performance of instruments for measurement of airborne particle concentrations*

ISO 15767, *Workplace atmospheres – Controlling and characterizing errors in weighing collected aerosols*

3 Terms and definitions

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

3.1
airborne dust
finely divided matter in solid form, dispersed in air

3.2
health-related fractions
inhalable, thoracic and respirable fractions of airborne dust

NOTE For definitions of the inhalable, thoracic and respirable fractions, see EN 481.

3.3
collected sample
airborne particles collected on the sampling media (e.g. filter, foam or impaction plate) for subsequent analysis

NOTE Sample deposits in other parts of the sampler such as inner walls are only included in the collected sample where the method description includes specific instructions for the recovery of such deposits.