

ICS: 13.040.30

Geregistreeerde Belgische norm

NBN EN 481

1e uitg., september 1993

Normklasse: T 96

Werkplaatsatmosferen - Definities van de deeltjesgrootteverdeling voor de meting van in de lucht zwevende deeltjes

Atmosphères des lieux de travail - Définition des fractions de taille pour le mesurage des particules en suspension dans l'air

Workplace atmospheres - Size fraction definitions for measurement of airborne particles

Toelating tot publicatie: 21 september 1993

Deze Europese norm EN 481:1993 heeft de status van een Belgische norm.

Deze Europese norm bestaat in drie officiële versies (Duits, Engels, Frans).



Bureau voor Normalisatie - Birminghamstraat 131 - 1070 Brussel - België

Tel: +32 2 738 01 12 - Fax: +32 2 733 42 64 - E-mail: info@nbn.be - NBN Online: www.nbn.be
Bank 000-3255621-10 IBAN BE41 0003 2556 2110 BIC BPOTBEB1 BTW BE0880857592

ICS: 13.040.30

***norme belge
enregistrée***

NBN EN 481

1e éd., septembre 1993

Indice de classement: T 96

Atmosphères des lieux de travail - Définition des fractions de taille pour le mesurage des particules en suspension dans l'air

Werkplaatsatmosferen - Definities van de deeltjesgrootteverdeling voor de meting van in de lucht zwevende deeltjes

Workplace atmospheres - Size fraction definitions for measurement of airborne particles

Autorisation de publication: 21 septembre 1993

La présente norme européenne EN 481:1993 a le statut d'une norme belge.

La présente norme européenne existe en trois versions officielles (allemand, anglais, français).



Bureau de Normalisation - Rue de Birmingham 131 - 1070 Bruxelles - Belgique

Tél: +32 2 738 01 12 - Fax: +32 2 733 42 64 - E-mail: info@nbn.be - NBN Online: www.nbn.be
Banque 000-3255621-10 IBAN BE41 0003 2556 2110 BIC BPOTBEB1 TVA BE0880857592

EUROPEAN STANDARD

EN 481

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 1993

UDC 628.511.1:620.113

Descriptors: Air, quality, air pollution, workroom, accident prevention, aerosols, sampling, suspended matter, measurements, particle density : concentration, specifications

English version

**Workplace atmospheres - Size fraction definitions
for measurement of airborne particles**

Atmosphères des lieux de travail - Définition
des fractions de taille pour le mesurage des
particules en suspension dans l'air

Arbeitsplatzatmosphäre - Festlegung der
Teilchengrößenverteilung zur Messung
luftgetragener Partikel

This European Standard was approved by CEN on 1993-07-27. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist 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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Page 2
EN 481:1993

Foreword

This European Standard was drawn up by the Technical Committee CEN/TC 137 "Assessment of workplace exposure" of which the secretariat is held by DIN.

This standard was submitted for Formal Vote, and the result was positive.

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 January 1994, and conflicting national standards shall be withdrawn at the latest by January 1994.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

0 Introduction

The proportion of total particulate matter which is inhaled into a human body depends on properties of the particles, on the speed and direction of air movement near the body, on breathing rate, and whether breathing is through nose or mouth. Inhaled particles can then deposit somewhere in the respiratory tract, or can be exhaled. The site of deposition, or probability of exhalation, depends on properties of the particle, respiratory tract, breathing pattern, and other factors.

Liquid particles or soluble components of solid particles can be absorbed by the tissues wherever they deposit. Particles can cause damage close to the deposition site if they are corrosive, radioactive, or capable of initiating some other type of damage. Insoluble particles can be transported to another part of the respiratory tract or body, where they can be absorbed or cause a biological effect.

There is a wide variation from one person to another in the probability of particle inhalation, deposition, reaction to deposition, and clearance. Nevertheless, it is possible to define conventions for size selective sampling of airborne particles when the purpose of sampling is health-related. These conventions are relationships between aerodynamic diameter and the fractions to be collected or measured, which approximate to the fractions penetrating to regions of the respiratory tract under average conditions. Measurement conducted according to these conventions will probably yield a better relationship between measured concentration and risk of disease.

Note:

For further information on the factors affecting inhalation and deposition, and their application in standards, see [8], [9], [10], [11], [12] and [13].

Workplace atmospheres - Size fraction definitions for measurement of airborne particles

1 Scope

This standard defines sampling conventions for particle size fractions which are to be used in assessing the possible health effects resulting from inhalation of airborne particles in the workplace. They are derived from experimental data for healthy adults. Conventions are defined for the inhalable, thoracic and respirable fractions; extrathoracic and tracheobronchial conventions may be calculated from the defined conventions. (The inhalable fraction is sometimes called inspirable - the terms are equivalent. The nomenclature of the fractions is discussed in annex A). Assumptions are given in clause 4. The convention chosen will depend on the region of effect of the component of interest in the airborne particles (see clause 3). Conventions are stated in terms of mass fractions, but they may also be used when the intention is to evaluate the total surface area or the number of particles in the collected material.

In practice, the conventions will often be used to specify instruments to sample airborne particles for the purpose of measuring concentrations corresponding to