ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 13274-8:2002

Respiratory protective devices - Methods of test - Part 8: Determination of dolomite dust clogging

Atemschutzgeräte - Prüfverfahren - Teil 8: Bestimmung des Einspeicherns von Dolomitstaub

Appareils de protection respiratoire - Méthodes d'essai - Partie 8: Détermination du colmatage par la poussière de dolomie

12/2002

National Foreword

This European Standard EN 13274-8:2002 was adopted as Luxembourgish Standard ILNAS-EN 13274-8:2002.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html

EUROPEAN STANDARD EN 13274-8

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2002

ICS 13.340.30

English version

Respiratory protective devices - Methods of test - Part 8: Determination of dolomite dust clogging

Appareils de protection respiratoire - Méthodes d'essai - Partie 8: Détermination du colmatage par la poussière de dolomie

Atemschutzgeräte - Prüfverfahren - Teil 8: Bestimmung des Einspeicherns von Dolomitstaub

This European Standard was approved by CEN on 23 October 2002.

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 Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

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

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 13274-8:2002 E

Contents

page

Foreword 3

Introduction 4

1 Scope 4

2 Normative references 4

3 Terms and definitions 4

4 Pre-requisites 4

5 General test requirements 5

6 Sample preparation 5

7 Test methods 5
7.1 Principle 5
7.2 Apparatus 5
7.3 Test conditions 5
7.4 Procedures 6
7.4.1 General 6
7.4.2 Procedure A - Continuous flow 6
7.4.3 Procedure B - Sinusoidal flow (ambient exhaled air) 6
7.4.4 Procedure C - Sinusoidal flow (conditioned exhaled air) 7

Annex A (informative) Test results – Uncertainty of measurement 15

Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives 16

Foreword

This document (EN 13274-8:2002) has been prepared by Technical Committee CEN/TC 79 “Respiratory protective devices”, 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 June 2003, and conflicting national standards shall be withdrawn at the latest by June 2003.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

It is one of several parts, which are as follows:

Part 1: Determination of inward leakage and total inward leakage

Part 2: Practical performance tests

Part 3: Determination of breathing resistance

Part 4: Flame tests

Part 5: Climatic conditions

Part 6: Determination of carbon dioxide content of the inhalation air

Part 7: Determination of particle filter penetration

Part 8: Determination of dolomite dust clogging

Annex A is informative.

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

Introduction

This European Standard is intended as a supplement to the specific device standards for respiratory protective devices. Test methods are specified for complete or parts of devices. If deviations from the test method given in this European Standard are necessary, these deviations will be specified in the relevant device standard.

1 Scope

This European Standard specifies the procedure for determination of dolomite dust clogging for respiratory protective devices.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 132, *Respiratory protective devices – Definitions of terms and pictograms.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 132 apply.

4 Pre-requisites

In order to implement this Part of EN 13274, at least the following parameters need to be specified in the relevant device standard:

- number of samples (including pre-filters if appropriate);
- mechanical conditioning;
- climatic conditioning;
- sample preparation;
- details of sample mounting in test chamber (e.g. orientation, adapter, dummy head);
- information about the state of the device before starting the test (e.g. filter, battery of a powered device);
- which test procedure (A, B, C);
- dust exposure;
- nominal air flow (if applicable, e.g. for multiple filters);
- breathing rate;
- temperature and humidity of the breathing air;

- pass/fail criteria.

5 General test requirements

Unless otherwise specified the values stated in this standard are expressed as nominal values. Except for temperature limits, values which are not stated as maxima or minima shall be subject to a tolerance of ± 5 %. Unless otherwise specified the ambient temperature for testing shall be from 16 °C to 32 °C and the temperature limits shall be subject to an accuracy of ± 1 °C.

6 Sample preparation

Before carrying out the test, examine the device to see that it is in the condition required by the relevant device standard. If appropriate, choose a suitable adaptor and check that the device can be fitted to it. If necessary, compare the breathing resistance with and without the adaptor.

7 Test methods

7.1 Principle

The test consists of drawing dust laden air through the filtering device and test (e.g. filter, filtering facepiece, powered device) until either:

a) a specified breathing resistance is reached, or:

b) a specified dust exposure is reached.

7.2 Apparatus

Choose a suitable mounting for the device, which shall be either an adaptor or a dummy head. If appropriate, check that the fit of the device on the mounting is leaktight. In all cases, the pressure drop introduced by the mounting has to be considered in results.

A typical arrangement of the test equipment is shown in Figure 1. The recommended dust test chamber used is shown in Figure 2. The working area of this chamber has a square section of 650 mm x 650 mm. A window allows the device to be introduced into the chamber. The linear speed and the particle size distribution (see Figure 3) are essential parameters of the test, and shall be verified if the geometry of the dust test chamber differs from that described here and in Figure 2.

NOTE An Andersen Cascade impactor has been found to be a suitable means of measuring particle size distribution of the airborne dolomite dust. Information on this equipment can be obtained from the Secretariat of CEN/TC 79.

7.3 Test conditions

The test agent is dolomite dust dispersed in a flow of air. It shall not be re-circulated or re-used.

NOTE Information about the supplier of dolomite dust, DRB 4/15) can be obtained from the Secretariat of CEN/TC 79.

The test agent is totally dispersed in a continuous airflow, to achieve a linear speed of 4 cm/s at the working area. This corresponds to an airflow rate of 60 m^3/h through the dust chamber shown in Figure 2. The airborne particle size distribution is shown in Figure 3.

The airborne dust concentration may be measured by drawing air at 2 l/min through a sampling probe equipped with a pre-weighed, high efficiency filter (open face diameter 37 mm) located near the test sample.

The climatic conditions within the working area for the duration of the test shall be (21 to 25) °C and (30 to 60) % RH.

7.4 Procedures

7.4.1 General

Three procedures (A, B, and C) are given, their selection being dependent on the type of device to be tested.

NOTE Procedure A is typically used for filters, procedure B is typically used for power-assisted devices and procedure C is typically used for filtering facepieces.

7.4.2 Procedure A - Continuous flow

The device is mounted on a suitable adaptor and connected to a pump which will draw a continuous airflow through the filter during the test. See Figure 4.

Position the device so that, where possible, the inlet surface of the filter(s) lies parallel to the airflow through the test chamber.

Check the pressure drop of the adaptor at the required air flow, by recording the change in pressure or by setting a new zero.

Generate the aerosol for at least 5 min before performing the test, in order to ensure that the aerosol is homogeneous and the dust concentration is constant before the test is started.

Pass the continuous air flow at the rate given in the prerequisites through the device under test and continually monitor the breathing resistance. Continue until the relevant limit, either breathing resistance or calculated testing time, is reached. Calculate the testing time from the ratio between the required dust exposure and the measured dust concentration.

NOTE For example, a dust exposure at 263 mgh/m^3 gives a testing time of 39,5 min with a dust concentration of 400 mg/m^3.

Stop the pump and carefully remove the device from the dust test chamber. Record the amount of dust deposited at the specified pressure drop, or vice versa.

7.4.3 Procedure B - Sinusoidal flow (ambient exhaled air)

The device is connected to a breathing simulator which inhales and exhales air at ambient conditions. See Figures 5 and 6.

Position the device so that, where possible, the inlet surface of the filter(s) lies parallel to the airflow through the test chamber.

Depending on the design of the device, place it either:

a) with the facepiece fitted to the dummy head, and then the whole device placed in the dust test chamber (see Figure 5);

b) with the facepiece fitted to the dummy head outside the test chamber, and the air inlet to the device located inside the dust test chamber (see Figure 6).

In both cases, fit the facepiece to the dummy head.

Generate the aerosol for at least 5 min before performing the test, in order to ensure that the aerosol is homogeneous and the dust concentration is constant before the test is started.

Switch on the blower unit of the device (if fitted). Set and operate the breathing simulator at the required rate and volume until the calculated testing time is reached.

NOTE For example, a dust exposure at 200 mgh/m^3 gives a testing time of 30 min with a dust concentration of 400 mg/m^3.