



**SLOVENSKI STANDARD**  
**SIST EN 14583:2004**

**01-december-2004**

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Workplace atmospheres - Volumetric bioaerosol sampling devices - Requirements and test methods

Arbeitsplatzatmosphäre - Volumetrische Probenahmeeinrichtungen für Bioaerosole - Anforderungen und Prüfverfahren

Air des lieux de travail - Appareils d'échantillonnage volumétrique des bioaérosols - Exigences et méthodes d'essai

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**Ta slovenski standard je istoveten z: EN 14583:2004**

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**ICS:**

13.040.30      Kakovost zraka na delovnem mestu      Workplace atmospheres

**SIST EN 14583:2004**

**en,fr,de**

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EUROPEAN STANDARD

EN 14583

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2004

ICS 13.040.30

English version

## Workplace atmospheres - Volumetric bioaerosol sampling devices - Requirements and test methods

Air des lieux de travail - Appareils d'échantillonnage volumétrique des bioaérosols - Exigences et méthodes d'essai

Arbeitsplatzatmosphäre - Volumetrische Probenahmeinrichtungen für Bioaerosole - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 9 July 2004.

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.

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.

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

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

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

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## Foreword

This document (EN 14583:2004) 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 March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Introduction

A European Standard is needed to promote the development of new equipment for measurement of micro-organisms in the work environment. This document can also apply to existing equipment. It is intended to specify requirements and methods to determine performance characteristics of sampling devices used to collect bioaerosols from the workplace atmosphere. Examples of test environments and methods will be described and test methods will be provided.

**WARNING — The use of this European Standard can involve hazardous materials, operations and equipment. This European Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this European Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.**

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## 1 Scope

This document specifies requirements and test methods to determine the performance of volumetric sampling devices used to assess bioaerosols in the workplace.

For clean room measurements EN ISO 14698-1 is applicable.

## 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 12919, *Workplace atmospheres — Pumps for the sampling of chemical agents with a volume flow rate of over 5 l/min — Requirements and test methods*

EN 13205, *Workplace atmosphere — Assessment of performance of instruments for measurement of airborne particle concentrations*

EN 50015, *Electrical apparatus for potentially explosive atmospheres — Oil immersion ‘o’*

EN 50016, *Electrical apparatus for potentially explosive atmospheres — Pressurised apparatus ‘p’.*

EN 50017, *Electrical apparatus for potentially explosive atmospheres — Powder filling ‘q’.*

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety ‘i’.*

EN 60079-0, *Electrical apparatus for potentially explosive atmospheres —Part 0: General requirements (IEC 60079-0: 2004)*

EN 60079-1, *Electrical apparatus for potentially explosive atmospheres — Part 1: Flameproof enclosure ‘d’ (IEC 60079-1:2003)*

EN 60079-7, *Electrical apparatus for explosive gas atmospheres — Part 7: Increased safety ‘e’ (IEC 60079-7: 2001)*

EN 60079-18, *Electrical apparatus for explosive gas atmospheres — Part 18: Construction, test and marking of type of protection encapsulation “m” electrical apparatus (IEC 60079-18:2004)*

EN 60079-25, *Electrical apparatus for explosive gas atmospheres — Part 25: Intrinsically safe systems (IEC 60079-25:2003)*

## 3 Terms and definitions

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

### 3.1

#### **accuracy**

closeness of agreement between a test result and the accepted reference value

**EN 14583:2004 (E)**

[ISO 3534-1:1993]

NOTE The quantity referred to in this document as accuracy provides an estimation of the range around the measured value in which can be found the accepted reference value with the confidence of 95 %.

**3.2****bias**

consistent deviation of the results of a measurement process from the true value of the air quality characteristic itself

[EN 482:1994]

**3.3****culturable number**

number of micro-organisms, single cells or aggregates able to form colonies on a solid nutrient medium

[EN 13098:2000]

**3.4****total number of micro-organisms**

number of micro-organisms determined as single organisms (or a corresponding measure)

[EN 13098:2000]

**3.5****personal sampler**

device, which samples air in the breathing zone of a person to determine exposure to biological agents

NOTE 1 Some sampling devices have integral pumps, and some do not. Where the instrument requires the use of an external pump, the pump is not subject to the requirements of this document.

[SIST EN 14583:2004](https://standards.iteh.ai/catalog/standards/sist/fd83260a-a753-4962-b814-f21a83b55741/sist-en-14583-2004)

NOTE 2 Adapted from EN 1540: <https://standards.iteh.ai/catalog/standards/sist/fd83260a-a753-4962-b814-f21a83b55741/sist-en-14583-2004>

**3.6****particle aerodynamic diameter**

diameter of a sphere of density  $1 \text{ g cm}^{-3}$  with the same terminal velocity due to gravitational force in calm air, as the particle, under the prevailing conditions of temperature, pressure and relative humidity

[EN 1540:1998]

**3.7****sampling device**

total equipment used for sampling, e. g. pump, sampling head and sampling substrate

**4 Abbreviated terms**

ATCC	American Type Culture Collection
BTC	bioaerosol test chamber
CBS	Centraalbureau voor Schimmelcultures
CCUG	Culture Collection University of Göteborg
DSMZ	Deutsche Stammsammlung für Mikroorganismen und Zellkulturen
HEPA	high efficiency particulate aerosol



NCTC	National Collection of Type Cultures
RH	relative humidity
T	temperature

## 5 Requirements

### 5.1 General

Performance requirements for volumetric sampling pumps shall comply with EN 1232 for low flow rate pumps or EN 12919 for high flow rate pumps. This shall apply both to integral and separate pumps.

### 5.2 Use in potentially explosive atmospheres

When the sampling device covered by this document is to be used in potentially explosive atmospheres, it shall comply with EN 50015 to EN 50017, EN 50020, EN 60079-0, EN 60079-1, EN 60079-7, EN 60079-18 and EN 60079-25.

### 5.3 Mechanical construction

Every sampling device shall be constructed in such a manner that it is easily accessible for regular function checks and that airflow can easily be measured and calibrated. The sampling pump shall maintain the required airflow rate throughout the sampling period.

NOTE Material used in the sampling head should be chosen to avoid moisture uptake and electrostatic charges.

### 5.4 Indicator devices

[SIST EN 14583:2004](https://standards.iteh.ai/catalog/standards/sist/fd83260a-a753-4962-b814-d183165574/sist-en-14583-2004)

[https://standards.iteh.ai/catalog/standards/sist/fd83260a-a753-4962-b814-](https://standards.iteh.ai/catalog/standards/sist/fd83260a-a753-4962-b814-d183165574/sist-en-14583-2004)

An indicator device shall be provided to show that the sampling device is switched on. If the sampling device has more than one measuring range, the selected range shall be clearly identified.

NOTE It is an advantage if elapsed time indicators, low flow rate indicators, flow interrupted indicators are given.

### 5.5 Adjustments

Any equipment (switch, knob, etc.) used for modifying the operating parameters (sampling time, flow rate, etc) of the sampling device shall be protected against involuntary action during sampling. The operational settings should be displayed.

### 5.6 Battery powered sampling devices

Sampling devices powered with integral batteries shall be provided with an early indication of low battery condition. Short recharge time, light-weight and low noise levels are recommended.

### 5.7 Airflow-control

During the sampling deviation from the required airflow should not exceed  $\pm 5\%$ .

### 5.8 Airflow-meter

A device to measure the airflow through the sampling device before and after sampling in the field should be supplied if required.

NOTE This device can be different from that used for calibration.