



SLOVENSKI STANDARD
oSIST prEN 1540:2020
01-september-2020

Izpostavljenost na delovnem mestu - Terminologija

Workplace exposure - Terminology

Exposition am Arbeitsplatz - Terminologie

Exposition sur les lieux de travail - Terminologie

Ta slovenski standard je istoveten z: prEN 1540

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 1540

September 2020

ICS 01.040.13; 13.040.30

Will supersede EN 1540:2011

English Version

Workplace exposure - Terminology

Exposition sur les lieux de travail - Terminologie

Exposition am Arbeitsplatz - Terminologie

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 137.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 1540:2020) has been prepared by Technical Committee CEN/TC 137 "Assessment to workplace exposure of chemical and biological agents", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1540:2011.

The major technical changes between this document and the previous edition are as follows:

- a) The given terminology has been re-adjusted, where appropriate, to ISO 18158:2016, which represents a modified ISO-adoption of EN 1540:2011;
- b) The subdivision and order of the terms and definitions has partly been changed and simplified by deleting some subheadings;
- c) The following terms and definitions (synonymous terms given in *italic*) have been added:

- 1) General terms:

aerodynamic diameter, aerodynamic equivalent diameter, agglomerate, aggregate, (air) sampling device, appraiser, coagulation, diffusive diameter, diffusive equivalent diameter, dustiness mass fraction, effective density, equivalent density, exposure by inhalation, exposure profile, inhalation exposure, material density, median diameter, median particle diameter, microbial compound, mobility diameter, mobility equivalent diameter, nanomaterial, nano-object, nanoparticle, nanoscale, particle, aerodynamic equivalent diameter, particle diffusive diameter, particle diffusive equivalent diameter, particle material density, particle mobility diameter, particle mobility equivalent diameter, particle number concentration, particle size, particle size distribution, particle surface area, similar exposure group, source domain, surface area, ultrafine particle, volume diameter, volume equivalent diameter

- 2) Terms related to the physical and chemical processes of workplace (air) sampling:

area sampling, back pressure, blank, blank sample, direct-reading instrument, flow-controlled pump, method blank, pressure drop, real-time monitor, sampling cassette, vapour sampler

- 3) Terms related to the analytical method:

test gas

- 4) Terms related to method performance:

analytical error, collection efficiency, measurement bias, measurement error, measurement precision, random error, random error of measurement, random measurement error, random sampling error, repeatability condition of measurement, reproducibility condition of measurement, sampler bias, sampling bias, sampling error, systematic analytical error, systematic error, systematic sampling error, systematic sampling uncertainty

- d) The term "thermodynamic diameter" is no longer used (see 3.1.3.12).

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- e) The term "efficiency curve" has been deleted as synonymous term for "sampling efficiency".
- f) In Annex A, an additional column has been introduced for symbols used.

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1 Scope

This document specifies terms and definitions that are related to the assessment of workplace exposure to chemical and biological agents. These are either general terms or are specific to physical and chemical processes of air sampling, the analytical method or method performance.

The terms included are those that have been identified as being fundamental because their definition is necessary to avoid ambiguity and ensure consistency of use.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 General terms

3.1.1 Agents

3.1.1.1

biological agent

bacteria, viruses, fungi and other micro-organisms or microbial compounds, including those which have been genetically modified, cell cultures and human endoparasites which can provoke hazardous effects

Note 1 to entry: Examples for hazardous effects are infections, allergies, toxicity and inflammations.

Note 2 to entry: Dusts of organic origin, for example pollen, flour dust and wood dust, are not considered to be biological agents and are therefore not covered by this definition.

3.1.1.2

chemical agent

chemical element or compound on its own or admixed as it occurs in the natural state or as produced, used, or released, including release as waste, by any work activity, whether or not produced intentionally and whether or not placed on the market

3.1.2 Air pollutants

3.1.2.1

air pollutant

chemical or biological agent emitted into the atmosphere either by human activity or natural processes and adversely affecting humans or the environment

[SOURCE: ISO 18158:2016, 2.1.2.1, modified – "material" has been replaced with "chemical or biological agent"]

3.1.2.2

airborne dust

chemical or biological agent in solid form, dispersed in air

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prEN 1540:2020 (E)**3.1.2.3****airborne particles**

chemical or biological agent in solid or liquid form, dispersed in air

[SOURCE: ISO 18158:2016, 2.1.2.3, modified – "fine matter" has been replaced with "chemical or biological agent"]

3.1.2.4**total airborne particles**

airborne particles present in a given volume of air

[SOURCE: ISO 18158:2016, 2.1.2.4]

3.1.2.5**aerosol**

airborne particles and the gas (and vapour) mixture in which they are suspended

Note 1 to entry: The airborne particles can be in or out of equilibrium with their own vapours.

[SOURCE: ISO 18158:2016, 2.1.4.1]

3.1.2.6**bioaerosol**

biological agent(s) suspended in air

Note 1 to entry: Airborne dusts of organic origin (for example cotton dust, flour dust and wood dust), are not considered to be bioaerosols and are therefore not covered by this definition.

[SOURCE: ISO 18158:2016, 2.1.4.2, modified, "aerosol consisting of (a)" deleted from the beginning of the definition and "suspended in air" added at the end of the definition]

3.1.2.7**microbial compound**

cell or cell wall component or metabolite of microbial origin

Note 1 to entry: Endotoxins, glucans, mycotoxins and enzymes are examples of microbial compounds. Microbial DNA is also included in this definition.

Note 2 to entry: Microbial compounds also include the chemical agents which are produced by microorganisms.

[SOURCE: EN 13098:2019, 3.17 modified, Note 2 to entry added]

3.1.2.8**vapour**

gas phase of a substance in a state of equilibrium or disturbed equilibrium with the same substance in a liquid or solid state below its boiling or sublimation point

3.1.3 Particles**3.1.3.1****health-related fractions**

<airborne particles> collective term for the fractions of airborne particles penetrating to different regions of the respiratory tract, i.e. the inhalable, thoracic and respirable fractions

3.1.3.2**inhalable fraction**

mass fraction of total airborne particles which is inhaled through the nose and mouth

[SOURCE: ISO 18158:2016, 2.1.3.1.1, modified – Note 1 to entry has been deleted]

3.1.3.3**thoracic fraction**

mass fraction of total airborne particles which penetrate beyond the larynx

[SOURCE: ISO 18158:2016, 2.1.3.1.3]

3.1.3.4**respirable fraction**

mass fraction of airborne particles which penetrate to the unciliated airways

[SOURCE: ISO 18158:2016, 2.1.3.1.4, modified – "total" has been deleted from the definition]

3.1.3.5**nanoparticle**

ultrafine particle

particle with a nominal diameter (such as geometric, aerodynamic, mobility, projected-area or otherwise) of 100 nm or less

Note 1 to entry: The term ultrafine particle is often used in the context of particles produced as a by-product of a process (incidental particles), such as welding fume and combustion fume.

[SOURCE: ISO/TR 27628:2007, 2.21, modified – "nanoparticle" has been introduced as preferred term and "ultrafine particle" has been added to Note 1 to entry]

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3.1.3.6**particle size**

linear dimension of a particle determined by a specified measuring procedure and under specified measurement conditions

[SOURCE: ISO 26824:2013, modified – "measurement method" has been replaced with "measuring procedure"]

3.1.3.7**particle size distribution**

distribution of particles as a function of particle size

Note 1 to entry: Particle size distribution can be expressed as cumulative distribution or a distribution density (distribution of the fraction of material in a particle size class, divided by the width of that class).

Note 2 to entry: Adapted from EN ISO 14644-1:2015.

[SOURCE: EN 17199-1:2019, 3.6]

3.1.3.8**particle number concentration**

C_N

number of particles related to the unit volume of the carrier gas

Note 1 to entry: The particle number concentration is given as number per cubic centimetre [cm^{-3}].

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[SOURCE: EN 16897:2017, 3.7, modified – Notes 1 and 2 to entry have been deleted]

3.1.3.9**dustiness**

propensity of materials to produce airborne dust during handling

Note 1 to entry Dustiness is not an intrinsic property as it depends on how it is measured.

3.1.3.10**dustiness mass fraction**

w_t

ratio of a health-related fraction of airborne dust produced by the dustiness test procedure to the test mass for the respective test method t

3.1.3.11**particle aerodynamic diameter**

aerodynamic diameter

particle aerodynamic equivalent diameter

aerodynamic equivalent diameter

d_{ae}

diameter of a sphere of 1 g/cm^3 density with the same terminal settling velocity in calm air as the particle, under the prevailing conditions of temperature, pressure and relative humidity

Note 1 to entry: In the human respiratory tract, the separation of particles with an aerodynamic diameter smaller than approximately $0,4 \mu\text{m}$ is better characterized by the particle diffusive equivalent diameter.

[SOURCE ISO 18158:2016, 2.1.4.8, modified – Further admitted terms, letter symbol and Note 1 to entry have been taken over from EN 16966:2018]

3.1.3.12**particle diffusive diameter**

particle diffusive equivalent diameter

diffusive equivalent diameter

diffusive diameter

DEPRECATED: thermodynamic diameter

d_{de}

diameter of a sphere with the same diffusion coefficient as the particle under prevailing condition of temperature and pressure within the respiratory tract

Note 1 to entry: For particles with aerodynamic diameter above approximately $0,4 \mu\text{m}$, the aerodynamic diameter becomes more significant in characterizing deposition than particle diffusive diameter.

[SOURCE: EN ISO 13138:2012, 3.2, modified — "Particle diffusive diameter" has been introduced as new preferred term, further admitted terms have been added, term 'thermodynamic diameter' is referred as deprecated; Notes 1 to 3 to entry have been deleted]

3.1.3.13**particle mobility diameter**

particle mobility equivalent diameter

mobility equivalent diameter

mobility diameter

 d_{me}

diameter of a sphere carrying a single elementary charge with the same drift speed in an electric field as the particle under prevailing condition of temperature and pressure

Note 1 to entry: The mobility diameter of a particle depends on its size, shape and electric charge level (which depends on the charging process involving its capacitance, i.e. its capacity to become electrically charged by bipolar air ions), but not of its density.

[SOURCE EN 16966:2018, 3.21]

3.1.3.14**volume diameter**

volume equivalent diameter

diameter of a sphere with the same volume as the particle under prevailing condition of temperature and pressure

[SOURCE EN 16966:2018, 3.25, modified – Notes 1 and 2 to entry have been deleted]

3.1.3.15**agglomerate**

collection of weakly bound particles or aggregates or mixtures of the two where the resulting external surface area is similar to the sum of the surface areas of the individual components

Note 1 to entry: The forces holding an agglomerate together are weak forces, for example van der Waals forces, or simple physical entanglement.

Note 2 to entry: Agglomerates are also termed secondary particles and the original source particles are termed primary particles.

[SOURCE: CEN ISO/TS 80004-2:2017, 3.4]

3.1.3.16**aggregate**

particle comprising strongly bonded or fused particles where the resulting external surface area can be significantly smaller than the sum of calculated surface areas of the individual components

Note 1 to entry: The forces holding an aggregate together are strong forces, for example covalent bonds, or those resulting from sintering or complex physical entanglement.

Note 2 to entry: Aggregates are also termed secondary particles and the original source particles are termed primary particles.

[SOURCE: CEN ISO/TS 80004-2:2017, 3.5]

3.1.3.17**coagulation**

process caused by relative motion between particles which causes particles to collide with each other and thereafter adhering to one another

[SOURCE EN 16966:2018, 3.5, modified – Note 1 to entry has been deleted]

prEN 1540:2020 (E)**3.1.3.18****equivalent density**

effective density

ratio of mass of an agglomerate/aggregate to the volume of a sphere defined by an equivalent diameter of the same agglomerate/aggregate

Note 1 to entry: The effective density generally decreases as the size of an agglomerate/aggregate increases.

[SOURCE EN 16966:2018, 3.7]

3.1.3.19**material density**

particle material density

ratio of particle mass to particle volume excluding all pores, voids and other gas containing compartments

[SOURCE EN 16966:2018, 3.11]

3.1.3.20**median diameter**

median particle diameter

particle size of a particle distribution for which one-half the total number of particles are larger and one-half are smaller

[SOURCE: ISO 16972:2010, 3.47]

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3.1.3.21**nanomaterial**

material with any external dimensions in the nanoscale or having internal structure or surface structure in the nanoscale

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[SOURCE: CEN ISO/TS 80004-1:2015, 2.4]

3.1.3.22**nano-object**

discrete piece of material with one, two or three external dimensions in the nanoscale

Note 1 to entry: The second and third external dimensions are orthogonal to the first dimension and to each other.

[SOURCE: CEN ISO/TS 80004-1: 2015, 2.5]

3.1.3.23**nanoscale**

length range approximately from 1 nm to 100 nm

Note 1 to entry: Properties that are not extrapolations from larger sizes are predominantly exhibited in this length range.

[SOURCE: CEN ISO/TS 80004-1: 2015, 2.1]