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Stationary source emissions - Determination of odour concentration by dynamic olfactometry and odour emission rate

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Stationary source emissions - Determination of odour concentration by dynamic olfactometry and odour emission rate

Émissions de sources fixes - Détermination de la concentration d'odeur par olfactométrie dynamique et du taux d'émission d'odeurs

Emissionen aus stationären Quellen - Bestimmung der Geruchsstoffkonzentration durch dynamische Olfaktometrie und die Geruchsstoffemissionsrate

This European Standard was approved by CEN on 12 December 2021.

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

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European foreword

This document (EN 13725:2022) has been prepared by Technical Committee CEN/TC 264 “Air quality”, 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of an identical text or by endorsement, at the latest by August 2022, and conflicting national standards shall be withdrawn at the latest by August 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13725:2003. The methods defined in the first edition and its associated quality criteria have been validated in numerous proficiency tests.

The main changes in this revision relative to the first edition EN 13725:2003 are listed in informative Annex N.

Annexes A, B, C, D, E, F, G, H, I, J, K, L, M and N are all informative.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

1 Scope

This document specifies an objective method for the determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors. The document also specifies a method for the determination of the odour emission rate from stationary sources, in particular:

- a) point sources (conveyed or ducted emissions);
- b) active area sources (e.g. biofilters).

The primary application of this document is to provide a common basis for evaluation of odour emissions.

When this document is used for the determination of the odour concentration or the odour emission rate of stationary source emissions, the other relevant European Standards concerning stationary source emissions apply, in particular EN 15259 and EN ISO 16911-1, especially when measurements have to comply with the relevant European Directives concerning industrial air emissions.

Even so, the analysis/quantification step of the measurement method described in this document (i.e. the determination of the odour concentration of an odorous gas sample, without respect to the origin of the sample itself) may be fully applied in many cases not related with industrial emission sources (e.g. the measurement of the mass concentration at the detection threshold of odorant substances, the determination of effectiveness of deodorising systems for indoor air). In those latter cases, the requirements in this document concerning the measurement planning and the sampling of stationary sources may be ignored or adapted.

This document is applicable to the measurement of odour concentration of odorous gas, mixtures of odorants of defined composition and undefined mixtures of odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor. The unit of measurement is the European odour unit per cubic metre: ou_E/m^3 . The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition $1 \text{ ou}_E/\text{m}^3$. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement is typically from $10^1 \text{ ou}_E/\text{m}^3$ to $10^7 \text{ ou}_E/\text{m}^3$ (including pre-dilution).

The field of application of this document includes:

- 1) the measurement of the mass concentration at the detection threshold of odorants in g/m^3 ;
- 2) the determination of the SROM value of secondary reference odorant gas, in mol;
- 3) the measurement of the odour concentration of mixtures of odorants in ou_E/m^3 ;
- 4) the measurement of the odour emission rate from point sources and active area sources, including pre-dilution during sampling;
- 5) the sampling of odorous gases from emissions of high humidity and temperature (up to $200 \text{ }^\circ\text{C}$);
- 6) the determination of effectiveness of mitigation techniques used to reduce odour emissions.

The determination of odour emissions requires measurement of gas velocity to determine the volume flow rate.

The field of application of this document does not include:

- i. the measurement of odours potentially released by particles of odorous solids or droplets of odorous fluids suspended in emissions;
- ii. the measuring strategy to be applied in case of variable emission rates;

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- iii. subjective methods for the sensory measurement of the relationship between odour stimulus and assessor response above detection threshold (perceived intensity);
- iv. subjective methods for the sensory measurement of hedonic tone (or (un)pleasantness) or assessment of annoyance potential;
- v. direct measurement of odour exposure in ambient air. For this measurement purpose field panel methods exist which are the subject of EN 16841-1;
- vi. direct olfactometry, including field olfactometry;
- vii. static olfactometry;
- viii. measurement of the odour identification (recognition) threshold;
- ix. the determination of odour emission rate from volume sources, such as fugitive emissions from buildings;
- x. the determination of odour emission rate from passive area sources.

Although the ultimate application of odour concentration measurement is aimed at reducing odour nuisance, the relation between emissions, dispersion, exposure and annoyance is not within the scope of this document. The relation between measured odour concentrations and odour emissions according to this standard and the occurrence of odour nuisance is highly complex. It is profoundly influenced by the atmospheric processes determining the dispersion of odours, the quality of the odour (hedonic tone) and finally by the receptor characteristics of those exposed to the odour. These receptor characteristics not only vary strongly between individuals, but also in time within one individual.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15259:2007, *Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report*

EN ISO 16911-1, *Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts — Part 1: Manual reference method (ISO 16911-1)*

EN ISO 20988:2007, *Air quality — Guidelines for estimating measurement uncertainty (ISO 20988:2007)*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN