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Ambient air - Standard method for the measurement of benzene concentrations - Part 3: Automated pumped sampling with in situ gas chromatography

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/16

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EUROPEAN STANDARD

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English Version

Ambient air - Standard method for the measurement of benzene concentrations - Part 3: Automated pumped sampling with in situ gas chromatography

Qualité de l'air ambiant - Méthode normalisée pour le mesurage de la concentration en benzène - Partie 3: Prélèvement par pompage automatique avec analyse chromatographique en phase gazeuse sur site

Außenluft - Messverfahren zur Bestimmung von Benzolkonzentrationen - Teil 3: Automatische Probenahme mit einer Pumpe und gaschromatographische In-situ-Bestimmung

This European Standard was approved by CEN on 17 July 2015.

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

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Contents	Page
European foreword.....	4
1 Scope	5
2 Normative references	6
3 Terms and definitions	6
4 Abbreviated terms	11
5 Principle	12
5.1 General.....	12
5.2 Measuring principle.....	12
5.3 Type approval test.....	13
5.4 Field operation and quality control.....	14
6 Sampling equipment	14
6.1 General.....	14
6.2 Sampling location.....	14
6.3 Sampling system.....	14
6.4 Control and regulation of sample volume.....	15
6.5 Sampling pump for the manifold.....	15
7 Analyser equipment	16
7.1 General.....	16
7.2 Sampling trap.....	16
7.3 Sampling device.....	16
7.4 Thermal desorption unit.....	16
7.5 Separation unit.....	16
7.6 Detector.....	16
7.7 Data processing system.....	17
8 Type approval of benzene analysers	17
8.1 General.....	17
8.2 Relevant performance characteristics and performance criteria.....	18
8.3 Design changes (EN 15267-1 and EN 15267-2).....	19
8.4 Procedures for determination of the performance characteristics during the laboratory test.....	19
8.5 Determination of the performance characteristics during the field test.....	27
8.6 Expanded uncertainty calculation for type approval.....	31
9 Field operation and ongoing quality control	31
9.1 General.....	31
9.2 Suitability evaluation.....	32
9.3 Initial installation.....	33
9.4 Ongoing quality assurance/quality control.....	34
9.5 Calibration of the analyser.....	36
9.6 Checks.....	37
9.7 Maintenance.....	41
9.8 Data handling and data reports.....	41
9.9 Measurement uncertainty.....	42
10 Expression of results	42

11	Test reports and documentation	42
11.1	Type approval test.....	42
11.2	Field operation	44
	Annex A (normative) Test of lack of fit	45
	Annex B (informative) Sampling equipment.....	47
	Annex C (informative) Components and applications of benzene analysers.....	48
	Annex D (informative) Manifold testing equipment.....	50
	Annex E (normative) Type approval.....	52
	Annex F (informative) Calculation of uncertainty in field operation at the annual limit value	65
	Bibliography	72

European foreword

This document (EN 14662-3:2015) 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 May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

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

This document supersedes EN 14662-3:2005.

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 the Council Directive 2008/50/EC [1].

Details of significant technical changes between this European Standard and the previous edition are:

- Clause 8 has been brought in line with other Standards dealing with type approval of gas analysers;
- In 9.4 and 9.6, performance requirements have been modified or removed and additional performance criteria and tests have been introduced for repeatability at span level;
- In 9.5, formulae have been introduced for software adjustment of the raw analyser signal after calibration;
- In Annexes E and F, uncertainty calculations have been modified to be in conformity with EN ISO 14956.

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

1 Scope

This European Standard specifies a semi-continuous measurement method for the determination of the concentration of benzene present in ambient air based on automated sampling and analysis by gas chromatography. This European Standard describes the performance characteristics and sets the relevant minimum criteria required to select an appropriate automated gas chromatograph (GC) by means of type approval tests. It also includes the evaluation of the suitability of an analyser for use in a specific fixed site so as to meet the data quality requirements as specified in Annex I of Directive 2008/50/EC [1] and requirements during sampling, calibration and quality assurance for use.

The method is applicable to the determination of the mass concentration of benzene present in ambient air in the range up to 50 µg/m³ benzene. This concentration range represents the certification range for the type approval test.

Other ranges may be used depending on the levels present in ambient air.

NOTE 1 When the standard is used for other purposes than for measurements required by Directive 2008/50/EC, the ranges and uncertainty requirements may not apply.

The method covers the determination of ambient air concentrations of benzene in zones classified as rural areas, urban-background areas and traffic-orientated locations and locations influenced by industrial sources.

The results are expressed in µg/m³ (at 20 °C and 101,3 kPa).

NOTE 2 50 µg/m³ of benzene corresponds to 15,4 nmol/mol of benzene.

This European Standard contains information for different groups of users.

Clauses 5 to 7 and Annexes C and D contain general information about the principles of benzene measurement by automated gas chromatography and sampling equipment.

Clause 8 and Annex E are specifically directed towards test houses and laboratories that perform type-approval testing of benzene analysers. These sections contain information about:

- type-approval test conditions, test procedures and test requirements;
- analyser performance requirements;
- evaluation of the type-approval test results;
- evaluation of the uncertainty of the measurement results of the benzene analyser based on the type-approval test results.

Clauses 9 to 11 and Annex F are directed towards monitoring networks performing the practical measurements of benzene in ambient air. These sections contain information about:

- initial installation of the analyser in the monitoring network and acceptance testing;
- ongoing quality assurance/quality control;
- calculation and reporting of measurement results;
- evaluation of the uncertainty of measurement results under practical monitoring conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15267-1, *Air quality – Certification of automated measuring systems – Part 1: General principles*

EN 15267-2, *Air quality – Certification of automated measuring systems – Part 2: Initial assessment of the AMS manufacturer's quality management system and post certification surveillance for the manufacturing process*

EN ISO 6142, *Gas analysis – Preparation of calibration gas mixtures – Gravimetric method (ISO 6142)*

EN ISO 6143, *Gas analysis – Comparison methods for determining and checking the composition of calibration gas mixtures (ISO 6143)*

EN ISO 6144, *Gas analysis – Preparation of calibration gas mixtures – Static volumetric method (ISO 6144)*

EN ISO 6145-4, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 4: Continuous syringe injection method (ISO 6145-4)*

EN ISO 6145-6, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 6: Critical orifices (ISO 6145-6)*

EN ISO 6145-7, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 7: Thermal mass-flow controllers (ISO 6145-7)*

EN ISO 6145-8, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 8: Diffusion method (ISO 6145-8)*

EN ISO 6145-9, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 9: Saturation method (ISO 6145-9)*

EN ISO 6145-10, *Gas analysis – Preparation of calibration gas mixtures using dynamic volumetric methods – Part 10: Permeation method (ISO 6145-10)*

EN ISO 14956, *Air quality – Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty (ISO 14956)*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

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