

VÄLISÕHU KVALITEET. STANDARDMEETOD BENSEENI
KONTSENTRATSIOONI MÕÕTMISEKS. OSA 3:
AUTOMAATNE PUMPAMISEGA PROOVIVÕTT JA IN SITU
GAASKROMATOGRAAFIA

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 14662-3:2015 sisaldab Euroopa standardi EN 14662-3:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 14662-3:2015 consists of the English text of the European standard EN 14662-3:2015.
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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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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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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of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.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)*

3 Terms and definitions

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

3.1 adjustment

set of operations carried out on a measuring system so that it provides prescribed indications corresponding to given values of a quantity to be measured

Note 1 to entry: Types of adjustment of a measuring system include zero adjustment of a measuring system, offset adjustment, and span adjustment (sometimes called gain adjustment).