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I.S. EN 14625:2012

Ambient air - Standard method for the measurement of the concentration of ozone by ultraviolet photometry

I.S. EN 14625:2012

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Údarás um Chaighdeáin Náisiúnta na hÉireann

English Version

Ambient air - Standard method for the measurement of the concentration of ozone by ultraviolet photometry

Air ambiant - Méthode normalisée de mesurage de la concentration en ozone par photométrie U.V.

Luftqualität - Messverfahren zur Bestimmung der Konzentration von Ozon mit Ultraviolett-Photometrie

This European Standard was approved by CEN on 10 May 2012.

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Contents

Contents	2
Foreword.....	4
1 Scope	5
2 Normative references	6
3 Terms and definitions	6
4 Abbreviated terms	11
5 Principle.....	11
5.1 General.....	11
5.2 Measuring principle	11
5.3 Type approval test	12
5.4 Field operation and quality control.....	12
6 Sampling.....	12
6.1 General.....	12
6.2 Sampling location	13
6.3 Sampling system	13
6.4 Control and regulation of sample flow rate	14
6.5 Sampling pump for the manifold.....	14
7 Analyser equipment	14
7.1 General.....	14
7.2 Ultraviolet absorption cell.....	15
7.3 Ultraviolet source lamp	15
7.4 UV detector.....	15
7.5 Ozone-specific scrubber	15
7.6 Switching valve	15
7.7 Temperature indicator	15
7.8 Pressure indicator	15
7.9 Flow rate indicator	16
7.10 Sampling pump for the analyser	16
7.11 Internal ozone span source	16
7.12 Particle filter	16
8 Type approval of ultraviolet photometric ozone analysers.....	16
8.1 General.....	16
8.2 Relevant performance characteristics and performance criteria	17
8.3 Design change	18

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.....	30
8.6	Type approval and uncertainty calculation.....	33
9	Field operation and ongoing quality control	34
9.1	General.....	34
9.2	Suitability evaluation.....	34
9.3	Initial installation	36
9.4	Ongoing quality assurance/quality control.....	37
9.5	Calibration of the analyser.....	38
9.6	Checks	40
9.7	Maintenance	44
9.8	Data handling and data reports.....	44
9.9	Measurement uncertainty	45
10	Expression of results	45
11	Test reports and documentation.....	45
11.1	Type approval test.....	45
11.2	Field operation	47
Annex A	(normative) Test of lack of fit	48
Annex B	(informative) Sampling equipment.....	50
Annex C	(informative) Ultraviolet photometric analyser.....	52
Annex D	(informative) Manifold testing equipment	54
Annex E	(normative) Type approval.....	56
Annex F	(informative) Calculation of uncertainty in field operation at the hourly alert threshold value.....	75
Annex G	(informative) Calculation of uncertainty in field operation at the 8-hour target value	83
Annex H	(informative) Significant technical changes	93
Bibliography	94

Foreword

This document (EN 14625:2012) 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 February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.

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 14625:2005.

The technical changes made since EN 14625:2005 are listed in Annex H of this European Standard.

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, 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 continuous measurement method for the determination of the concentrations of ozone present in ambient air based on the ultraviolet photometric measuring principle. This standard describes the performance characteristics and sets the relevant minimum criteria required to select an appropriate ultraviolet photometric analyser 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 concentration of ozone present in ambient air up to $500 \mu\text{g}/\text{m}^3$. This concentration range represents the certification range for ozone for the type approval test.

NOTE 1 Other ranges may be used for measurement systems applied at rural locations monitoring ecosystems.

NOTE 2 When the standard is used for other purposes than Directive 2008/50/EC, the ranges and uncertainty requirements may not apply.

The method covers the determination of ambient air concentrations of ozone in zones classified as rural areas, urban and urban-background areas.

The results are expressed in $\mu\text{g}/\text{m}^3$ (at $20 \text{ }^\circ\text{C}$ and $101,3 \text{ kPa}$).

NOTE 3 $500 \mu\text{g}/\text{m}^3$ of O_3 corresponds to $250 \text{ nmol}/\text{mol}$ of O_3 at $20 \text{ }^\circ\text{C}$ and $101,3 \text{ kPa}$.

This standard contains information for different groups of users.

Clauses 5 to 7 and Annexes B and C contain general information about the principles of ozone measurement by ultraviolet photometric analyser and sampling equipment.

Clause 8 and Annex E are specifically directed towards test houses and laboratories that perform type-approval testing of ozone 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 ozone analyser based on the type-approval test results.

Clauses 9 to 11 and Annexes F and G are directed towards monitoring networks performing the practical measurements of ozone 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 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 14956, *Air quality — Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty (ISO 14956)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

ENV 13005:1999, *Guide to the expression of uncertainty in measurement*

ISO 13964:1998, *Air quality — Determination of ozone in ambient air — Ultraviolet photometric method*

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).

Note 2 to entry Adjustment of a measuring system should not be confused with calibration, which is a prerequisite for adjustment.

[SOURCE: JCGM 200:2012 (VIM) [2]]

Note 3 to entry In the context of this standard, adjustment is performed on measurement data rather than on the analyser.

3.2 alert threshold

level beyond which there is a risk to human health from brief exposure for the population as a whole and at which immediate steps are to be taken by the Member States

[SOURCE: 2008/50/EC [1]]

3.3 ambient air

outdoor air in the troposphere, excluding workplaces as defined by Directive 89/654/EEC, where provisions concerning health and safety at work apply and to which members of the public do not have regular access

[SOURCE: 2008/50/EC [1]]

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