BSI Standards Publication

Ambient air — Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence

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National foreword

This British Standard is the UK implementation of EN 14211:2024. It supersedes BS EN 14211:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EH/2/3, Ambient atmospheres.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Ambient air - Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence

Air ambiant - Méthode normalisée pour le mesurage de la concentration en dioxyde d'azote et monoxyde d'azote par chimiluminescence

Außenluft - Messverfahren zur Bestimmung der Konzentration von Stickstoffdioxid und Stickstoffmonoxid mit Chemilumineszenz

This European Standard was approved by CEN on 11 November 2024.

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European foreword

This document (EN 14211:2024) 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of an identical text or by endorsement, at the latest by June 2025, and conflicting national standards shall be withdrawn at the latest by June 2025.

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 14211:2012.

The technical modifications in comparison with the previous edition are listed in Annex H of this document.

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, Türkiye and the United Kingdom.

1 Scope

This document specifies a continuous measurement method for the determination of the concentrations of nitrogen dioxide and nitrogen monoxide present in ambient air based on the chemiluminescence measuring principle. This document describes the performance characteristics and sets the relevant minimum criteria required to select an appropriate chemiluminescence analyser by means of type testing. 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 (see Annex I of Directive 2008/50/EC [1] for additional information) and requirements during sampling, calibration and quality assurance for use.

The method is applicable to the determination of the concentration of nitrogen dioxide present in ambient air up to 500 µg/m^3. This concentration range represents the certification range for nitrogen dioxide for type testing.

The method is applicable to the determination of the concentration of nitrogen monoxide present in ambient air up to 1 200 µg/m^3. This concentration range represents the certification range for nitrogen monoxide for the type testing.

NOTE 1 It is possible to use other ranges depending on the levels present in ambient air.

NOTE 2 Exemplar uncertainty budget calculations are given in Annexes F to H referring to Directive 2008/50/EC [1]. In the event that the Limit Values are updated in future iterations of Directive 2008/50/EC [1], the user can use these new values to calculate measurement uncertainties.

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

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

NOTE 3 500 µg/m^3 of nitrogen dioxide corresponds to 261 nmol/mol of nitrogen dioxide at 20 °C and 101,3 kPa. 1 200 µg/m^3 of nitrogen monoxide corresponds to 962 nmol/mol of nitrogen monoxide at 20 °C and 101,3 kPa.

This document contains information for different groups of users.

Clause 5 to Clause 7 and Annex B and Annex C contain general information about the principles of NO_x measurement by chemiluminescence analyser and sampling equipment.

Clause 8, Annex E is specifically directed towards test houses and laboratories that perform type testing of NO_x analysers. These sections contain information about:

— type testing conditions, test procedures and test requirements;

— analyser performance requirements;

— evaluation of the type testing results;

— evaluation of the associated uncertainty of the measurement performed by the NO_x analyser based on the type testing results.

Clause 9 to Clause 11 and Annex F and Annex G are directed towards monitoring networks performing the practical measurements of NO_x 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;