SLOVENSKI STANDARD
oSIST prEN 50545-2:2027

01-januar-2027

Električne naprave za odkrivanje in merjenje strupenih in gorljivih plinov na avtomobilskih parkiriščih in v predorih - 2. del: Splošne tehnične zahteve in preskusne metode za meritve onesnaženosti zraka s plini in delci v predorih

Electrical apparatus for the detection and measurement of toxic and combustible gases in car parks and tunnels - Part 2: General performance requirements and test methods for gaseous and airborne pollution measurements in tunnels

Sample Document
Stop the standardization at this point

Matériel électrique de détection et de mesure de gaz combustible et toxique dans les parcs de stationnement et les tunnels - Partie 2: Exigences de performance générales et méthodes d'essai pour les mesures de la pollution gazeuse et atmosphérique dans les tunnels

Ta slovenski standard je istoveten z: **prEN 50545-2:2026**

ICS:

13.040.50	Emisije izpušnih plinov v prometu	Transport exhaust emissions
13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

oSIST prEN 50545-2:2027 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 50545-2

November 2026

ICS 13.320 -

English Version

Electrical apparatus for the detection and measurement of toxic and combustible gases in car parks and tunnels - Part 2: General performance requirements and test methods for gaseous and airborne pollution measurements in tunnels

To be completed To be completed

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2027-02-05.

It has been drawn up by CLC/TC 216.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 50545-2:2026) has been prepared by CLC/TC 216 “Gas detectors”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

— Latest date by which this document has to be announced at national level	(doa)	dav + 3 months
— latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dav + 9 months
— latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dav + 36 months(to confirm or change the vote)

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Introduction

With sustained road traffic and still significant emissions from vehicles, the main air quality pollutants (exhaust and non-exhaust) need to be monitored in road tunnels. The objective of this document is to ensure compliance with regulatory criteria for protecting the health of users, while also minimizing ventilation requirements to reduce energy consumption.

Important developments in air quality sensors over the last two decades can help to meet this objective. Road tunnel operators can now monitor concentrations of the main pollutants more accurately than in the past, provided that they select and correctly install the right equipment. Two complementary standards, ISO 23431 and this document now provide guidance when purchasing and using the appropriate equipment. The ISO standard describes methods for determining air speed and flow direction, CO, NO and NO_2 concentrations and visibility in road tunnels using direct-reading instruments and specifically excludes requirements relating to instrument conformance testing.

This document, prEN 50545-2 “General performance requirements and test methods for gaseous and airborne pollution measurements in tunnels“ designates unique ranges and test levels for target gases and visibility for the purpose of type testing, specifying minimum requirements. These ranges may be adapted to national and/or local regulations.

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1 Scope

This document applies to apparatus for the measurement of any of the following: carbon monoxide (CO), nitrogen monoxide (NO), nitrogen dioxide (NO_2) and visibility for the purpose of integration into tunnel control systems. The three aforementioned gases are generically called “target gases” for the purpose of this document. These target gases and visibility comprise the target measurands.

This document specifies general requirements for construction and validation testing and describes the test methods that apply to fixed apparatus for the measurement of the concentration of the target gases and visibility in tunnels.

This document applies to apparatus for use in road tunnels and similar infrastructures, for example railway tunnels with diesel locomotives, loading areas for trucks and trafficked areas of underground bus stations.

This document also applies when an apparatus manufacturer makes any claims regarding superior performance that exceeds these minimum requirements. Any enhanced performance or features claimed by the manufacturer outside the scope of this standard cannot be claimed to be certified by this document.

This document applies to apparatus, including the sampling system if applicable.

This document does not specify requirements for apparatus to be installed in hazardous areas.

This document does not apply to applications already covered by the following standards:

— car parks, covered by EN 50545-1;

— domestic premises, covered by EN 50291-1;

— boats, craft, caravans or mobile homes, covered by EN 50291-2;

— workplace atmospheres, covered by EN 45544 series;

— emissions of heaters, covered by EN 50379 series;

— motor vehicles emissions, covered by ISO/PAS 3930;

— monitoring of the LEL level of combustible gases, covered by EN 60079-29-1.

This document does not apply to the following applications, locations and technologies:

— confined spaces;

— laboratory equipment;

— apparatus used to control industrial processes;

— portable and transportable apparatus;

— tunnel construction;

— monitoring of combustible gases or VOCs;

— monitoring for fire detection;

— non-trafficked areas in underground bus stations;

— mines.

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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 50271, *Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies*

EN 60068-2-27, *Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock (IEC 60068-2-27)*

EN IEC 60068-2-52, *Environmental testing — Tests. Test Kb: Salt mist, cyclic (sodium chloride solution) and guidance. Shock (IEC 60068-2-52)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 61010-1:2010,[1] *Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements (IEC 61010-1)*

EN IEC 61326-1, *Electric equipment for measurement, control and laboratory use. EMC requirements — General requirements (IEC 61326-1)*

ISO 23431, *Measurement of road tunnel air quality*

Namur NE43, *Standardization of the Signal Level for the Failure Information of Digital Transmitters*

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3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
apparatus
component necessary for measuring the target measurands, contained in one or more enclosures which will be type tested according to this document

3.2
aspirated apparatus
apparatus that extracts air from the tunnel by a separate sampling system from single or multiple points, consisting of a separate sampling system and the sensor

3.3
clean air
air which is free from gases or vapours and particles to which the equipment is sensitive or which influence the performance of the equipment

[1] As impacted by EN 61010-1:2010/A1:2019 and EN 61010-1:2010/A1:2019/AC:2019-04.

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3.4
transit time
time a sample takes to travel from the sampling point to the point of measurement inside the sensor

3.5
co-location
measurement from the apparatus and a reference measurement system, sampling from the same location (within 5 metres) over the same time period

3.6
control unit
CU
part of the apparatus that receives and processes the signals generated by the sensors and also generates output functions

3.7
diffusion apparatus
apparatus that analyses air from the tunnel without using a separate sampling system

3.8
extinction coefficient
attenuation of light through a scattering and/or absorbing medium, described by the following function:

$$I(\lambda) = I_0 \cdot e^{-k(\lambda)\cdot d} \quad (1)$$

where

I_0 and I are the initial intensity and the intensity after a distance *d* of uniform, collimated light;

k is the extinction coefficient called K-value

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Note 1 to entry: The K-value of a medium has the unit m^{-1} (also commonly used 10^{-3} m^{-1}) and depends on the wavelength spectrum of the light source. Here, the K-value is used as a measurable parameter to estimate the visibility in a tunnel. A reduction of visibility in tunnels is primarily caused by light scattering and results in an increased K-value.

3.9
fault
abnormal condition that may cause a reduction in, or loss of, the capability of a functional unit to perform a required function

3.10
fault signal
audible, visible or other type of output, permitting, directly or indirectly, a warning or indication that there is a fault

3.11
final reading
asymptotic measurement value given by the apparatus after a long period of time

3.12
fixed apparatus
apparatus that is intended to have all parts permanently installed

3.13
hazardous area
<potentially explosive atmosphere> atmosphere which could become explosive due to local and operational conditions

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Note 1 to entry: Operation in hazardous areas can require legislative measures for the approval, installation and construction requirements of the apparatus.

3.14
indicator
means to provide visible and/or audible information

3.15
K-value
extinction coefficient

Note 1 to entry: See 3.8 *extinction coefficient.*

3.16
lower detectable limit
minimum pollutant concentration that produces a signal calculated as three times the standard deviation at zero

Note 1 to entry: E.g. ISO 23431.

3.17
calibration mask
device that can be attached to the equipment to present a test gas to the sensor in a reproducible manner

3.18
optical filter
<surrogates> optical element that attenuates the transmitted light intensity in the wavelength range employed by the optical sensor

Note 1 to entry: Optical filters shall be used as well-defined surrogates for dust in transmission monitors. They can be used for measuring both linearity and span in transmitted light monitors.

3.19
output signal
analogue or digital signal which is available at an output interface

3.20
particulate matter
PM
particles suspended in air, classified with diameters between 0,3 and 10 µm and measured and reported as PM_1, $PM_{2.5}$ (fine) and (PM_{10}-$PM_{2.5}$) (coarse)

Note 1 to entry: Although particulate matter measurement devices are not covered in this standard, important information is given in Annex C.

3.21
ppm
ppm_v
parts per million
ratio expressing the units of volume of gaseous pollutant contained in 1 000 000 units of volume of atmosphere

Note 1 to entry: It may equivalently be expressed as one million times the ratio of the partial pressure of gaseous pollutant to the pressure of the atmosphere in which it is contained.

3.22
power supply
device that provides suitable power to the system or part thereof

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