SLOVENSKI STANDARD
oSIST prEN 12966:2023

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Pokončni cestni znaki - Prometni znaki s spremenljivo vsebino

Road vertical signs - Variable message traffic signs

Vertikale Verkehrszeichen - Wechselverkehrszeichen

Signaux de signalisation routière verticale - Panneaux à messages variables

Ta slovenski standard je istoveten z: **prEN 12966**

ICS:

93.080.30	Cestna oprema in pomožne naprave	Road equipment and installations

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EUROPEAN STANDARD

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ICS

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English Version

Road vertical signs - Variable message traffic signs

Signaux de signalisation routière verticale - Panneaux à messages variables

Vertikale Verkehrszeichen - Wechselverkehrszeichen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 226.

If this draft becomes a European Standard, CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 12966rev:2023) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12966:2014+A1:2018

The main changes with respect to the previous edition EN 12966:2014+A1:2018 are listed below:

— Scope has been changed by removing mobile and temporary installed VMS, although required by mandate M111

— Normative references have been dated

— Terms AVCP, CPR, FPC have been removed from clause 3

— Title of clause 4 has been changed from Product characteristics to Characteristics

— Everything that is non-mandated was deleted from clause 4

— New AVCP guidance document that does not have the ISO 9001 note is used

— Tunnel classes L1(T) and L2(T) found obsolete and have been removed from clause 4.4.1

— New wording in note to Table 11

— Note to clause 4.4.7 with reference to DELEGATED REGULATION (EU) 2021/1958 was added

— Clause 4.5.2.2 Pollution was removed

— Note to clause 4.5.2.4.3 providing explanation about applicability of DSLx classes added

— Note for clarification of Luminance and Luminance ratio requirements inside tunnels was added at clause 5.5.4.4.1

— Better wording in clause 5.5.5 in regard with explaining test angles of L3(T)

— Clarification on test angles of L3(T) added

— Wording in clause M.2.2 improved in regard with element spacing

NOTE The structure of the document follows the requirements requested by the CEN HAS Consultant at the time of drafting the document.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Regulation (EU) No 305/2011.

For relationship with Regulation (EU) No. 305/2011 [1], see informative Annex ZA, which is an integral part of this document.

EN 12966, *Road vertical sign – Variable message traffic signs*, covers the product standard, assessment, and verification of constancy of performance (AVCP) including type testing and factory production control.

It derives from performance requirements and test methods published in CEN, CENELEC, CIE, IEC, and ISO documents.

Introduction

This document is designed for use by manufacturers, who are placing their variable message traffic signs on the market, as well as by Road Authorities and private developers who wish to use variable message signs. It provides requirements for performance of characteristics of these signs, test and assessment methods and the means of assessment and verification of constancy of performance (AVCP).

This document is a product standard covering the requirements for variable message traffic signs (VMS). A VMS is a sign where the information shown can be changed or switched on or off as required. The information can be text and/or symbols.

VMS fall into the two different types of continuous and discontinuous. Continuous VMS show sign faces of the types of fixed signs defined in EN 12899. Discontinuous VMS use luminous elements to show different messages on a single sign face.

There is diversity of VMS. Some have elements that are placed with a view of displaying a few predetermined messages, while other have elements placed in arrays. Some can show messages where all elements have approximately the same luminous intensity while other can vary the luminous intensity individually. Some can show certain predetermined colours, while other can show a range of colours. Some can show only character legends while other can show a wider range of legends.

This document does not describe the detailed form and configuration of a VMS. Therefore, test modules representing the VMS are used to demonstrate compliance with the requirements of this document because of the impracticality of testing some complete VMS.

Because of the major demands on a sign for good legibility and visibility throughout the required viewing range, the main properties of the sign are described. These properties can vary depending on the situation. For example, it will not be necessary to ask for a minimum temperature requirement of -40 °C in Greece, but this needs to be considered in Lapland. For visual performance there will be a difference between installation on highways - with good distance visibility and a narrow beam width - and installation in cities, where there is only short distance legibility and when a wide beam width may be required.

This document uses requirements for performance of the characteristics, which are not dependent on technology. The visual and environmental performance is demonstrated on a test module representing the VMS. This European Standard contains a number of defined requirements on VMS, some of which have to be demonstrated on the test module, others that are to be verified by the manufacturer. It is the manufacturer's responsibility to ensure that the VMS is fully represented by the test module.

The performances of the main characteristics of discontinuous VMS are given by classes, which are designed to be selected by choosing a combination of classes dependent on the end-user's requirements. National annexes may define class combination applicable to the local needs. This combination covers not only the regulatory requirements of the destination country but also issues of lifetime, quality, maintenance, and construction, all of which affect the ability of a sign in its particular application, to meet safety and fitness for purpose. The details in the informative annexes are provided as useful guidance on the additional aspects relating to VMS for those setting up purchasing contracts for signs or signing systems.

Installed discontinuous VMS shall be regulated in view of the ambient light and the stroke width of legends to provide the intended apparent luminance and balance of colours. Symbols and fonts for character legends shall be designed to provide best possible legibility.

The working environment for VMS can be relatively harsh and equipment that is deemed "fit for purpose" is expected to last in an exposed, corrosive environment for a minimum of 10 years. It is essential that all materials and manufacturing processes take this into account.

1 Scope

This document provides specifications for two types of variable message signs (VMS); i.e., continuous (see 3.3) and discontinuous (see 3.6).

This document covers permanently installed VMS used in circulation areas, on public and private land, including tunnels for the information, guidance, warning and/or direction of traffic. Test modules are used to demonstrate compliance with the requirements.

This document specifies visual and physical characteristics of VMS as well as their durability aspects. It also provides relevant requirements and corresponding test methods, assessment, and verification of constancy of performance (AVCP) and marking.

NOTE Provisions for the evaluation of conformity with regards to type testing are further specified in 6.2; provisions with regards to factory production control (FPC) are further specified in 6.3.1.

This document does not cover:

a) sign gantries, cantilevers, posts (supports) and foundations,

b) signal heads,

c) sizes and shapes of VMS messages,

d) control units and monitoring units unless inside the VMS,

e) control of sign luminance.

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 12899-1:2007, *Fixed, vertical road traffic signs — Part 1: Fixed signs*

EN 12899-4:2007, *Fixed, vertical road traffic signs — Part 4: Factory production control*

EN 50293:2012, *Road traffic signal systems — Electromagnetic compatibility*

EN 50556:2018, *Road traffic signal systems*

EN 60068-2-1: 2007, *Environmental testing — Part 2-1: Tests — Tests A: Cold (IEC 60068-2-1)*

EN 60068-2-2:2007, *Environmental testing — Part 2-2: Tests — Tests B: Dry heat (IEC 60068-2-2)*

EN 60068-2-5:2018, *Environmental testing — Part 2-5: Tests — Test Sa: Simulated solar radiation at ground level and guidance for solar radiation testing (IEC 60068-2-5)*

EN 60068-2-14:2009, *Environmental testing — Part 2-14: Tests — Test N: change of temperature (IEC 60068-2-14)*

EN 60068-2-30:2005, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30)*

EN 60068-2-64:2008 +A1:2019, *Environmental testing — Part 2-64: Tests— Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64)*

EN 60529:1991+A1:2000+A2:2013, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989/A2:2013/COR1:2019)*

EN 60598-1:2021, *Luminaires — Part 1: General requirements and tests*

EN 62368-1:2020, Audio/video, *Information and communication technology — Safety - Part 1: Safety requirements (IEC 62368-1:201427, modified)*

EN ISO 9227:2017-07, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2012)*

IEC 60417-1, *Graphical symbols for use on equipment — Part 1: Overview and application*

ISO 7000:2014, *Graphical symbols for use on equipment — Registered symbols*

CIE 015:2018, *Colorimetry*

CIE S 017:2020, International lighting vocabulary

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in CIE 015:2018 and CIE S 017:2020 and the following 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
backing board
surround to the VMS, used depending on local circumstances, providing improved visibility of the VMS by means of increasing its size and by providing suitable visible contrast with the VMS background

3.2
cantilever support
support system with a single post and a cantilever arm supporting VMS(s) mounted over the traffic lane(s)

3.3
CCM
compliance criteria met

3.4
continuous VMS
similar to fixed signs, the only difference being that by some electro- and/or mechanical means they change between messages

EXAMPLE: Rotating prism signs, roller blinds, etc.

Note 1 to entry: Fixed signs are specified in accordance with EN 12899-1:2007.

3.5
control device
equipment used to execute a change of message other than by purely manual means

3.6
CWFT
classification without further testing

3.7
discontinuous VMS
signs which create messages using discontinuous individual elements that can be in one of two states (or more) and can thereby create various messages on the same sign face, in the following colours: white, yellow, orange, green, red and blue as specified herein

Example: Fibre optic signs, LED signs, LCD signs, etc.

3.8
display surface
visible part of a VMS that contains the elements that may be activated to display the message

3.9
distance between the light sources of adjacent elements
physical distance between the light sources of adjacent elements

Note 1 to entry: See Figure A.2.

3.10
element
basic visual light emitting and/or reflecting object or cluster of objects in the display surface of a VMS, activated in conjunction with other elements to form the desired message-see also definition of “pixel”

3.11
element spacing
centre-centre distance of adjacent elements

3.12
equivalent area
it is needed for achieving the equivalent appearance of a VMS with a fixed sign in accordance with EN 12899-1:2007

Note 1 to entry: Further explanation is given in Annex A.

3.13
front panel
visible part of a sign comprising the display surface; and the backing-board when this is integrated in the front of the VMS

3.14
front screen
screen protecting the display surface or the parts of it against dust, water, etc.

3.15
gantry
support system spanning a carriageway with one or more posts on each side of the carriageway supporting VMS mounted over the traffic lanes