

LIIKLUSE REGULEERIMISE VAHENDID.
SIGNAALSEADMED

Traffic control equipment - Signal heads

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12368:2015 sisaldab Euroopa standardi EN 12368:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 12368:2015 consists of the English text of the European standard EN 12368:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.06.2015.	Date of Availability of the European standard is 24.06.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 93.080.30

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Traffic control equipment - Signal heads

Équipement de régulation du trafic - Signaux

Anlagen zur Verkehrssteuerung - Signalleuchten

This European Standard was approved by CEN on 11 January 2015.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Constructional Product Characteristics	8
4.1 General.....	8
4.2 Signal head.....	9
4.3 Performance under impact product characteristic	9
4.4 Constructional integrity product characteristic	9
5 Environmental, electromagnetic compatibility (EMC) and electrical product characteristics	9
5.1 Environmental characteristics	9
5.2 Electrical safety and EMC characteristics	10
6 Optical Product Characteristics	10
6.1 General.....	10
6.2 Diameter of signal lights	10
6.3 Luminous intensities of signal lights	10
6.4 Distribution of luminous intensity	11
6.5 Luminance uniformity	13
6.6 Maximum phantom signal.....	13
6.7 Colours of signal lights.....	13
6.8 Signal lights with symbols.....	14
6.9 Background screen of signal lights.....	14
6.10 Visible flicker.....	14
7 Constructional and environmental test methods.....	14
8 Optical test methods	17
8.1 General.....	17
8.2 Measurement of luminous intensities	17
8.3 Measurement of luminance for uniformity tests	18
8.4 Measurement of phantom signal.....	19
8.5 Measurement of the colour.....	20
8.6 Measurement of combined colours	20
9 Tolerances	21
10 Marking, labelling and product information.....	22
10.1 Marking and labelling	22
10.2 Product information.....	23
11 Assessment and verification of constancy of performance - AVCP	23
11.1 General.....	23
11.2 Type testing.....	24
11.2.1 General.....	24
11.2.2 Test samples, testing and compliance criteria.....	25
11.2.3 Test reports	27
11.2.4 Shared other party results	27
11.2.5 Cascading determination of the product-type results	28

11.3	Factory production control (FPC)	29
11.3.1	General	29
11.3.2	Requirements	29
11.3.3	Product specific requirements	32
11.3.4	Initial inspection of factory and of FPC	33
11.3.5	Continuous surveillance of FPC	33
11.3.6	Procedure for modifications	33
11.3.7	One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity	34
	Annex A (informative) Test, declarations and requirements	35
	Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation	37
ZA.1	Scope and relevant characteristics	37
ZA.2	Procedure for AVCP of Traffic control equipment – Signal heads	38
ZA.2.1	System(s) of AVCP	38
ZA.2.2	Declaration of performance (DoP)	39
ZA.2.2.1	General	39
ZA.2.2.2	Content	39
ZA.2.2.3	Example of DoP	40
ZA.3	CE marking and labelling	42
	Bibliography	45

Foreword

This document (EN 12368:2015) has been prepared by Technical Committee CEN/TC 226 "Road equipment", the secretariat of which is held by AFNOR.

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 December 2015, and conflicting national standards shall be withdrawn at the latest by March 2017.

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 12368:2006.

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 EU Directive(s).

For relationship with EU Directive, see Informative Annex ZA, which is an integral part of this document.

The main changes in this revision are as follows:

- a) Introduction: Paragraph 6 added outlining reasons for possible degradation of optical performance;
- b) Scope: Individual optical units included in addition to complete signal heads which were in the previous version;
- c) Clauses 4 to 8 Requirements re phrased to clearly identify Product Characteristics as required in the CPR;
 - 1) 4.2 Signal head:- Class V IP65 added as some signals are required with the higher sealing for example in tunnels. A warning note was also added that higher sealing levels can lead to risk of trapped moisture;
 - 2) 4.3 Mountings, poles with brackets and catenaries: removed as topic considered outside of the scope of this standard as the infrastructure to which signals are mounted are the subject of other standards. Table ZA.1 and Clause 8 of DoP updated accordingly to remove these characteristics;
 - 3) 4.4 Deflection: removed as infrastructure, poles, gantries catenaries etc considered outside of the scope of this standard, as the infrastructure to which signals are mounted are the subject of other standards. Table ZA.1 and Clause 8 of DoP updated accordingly to remove these characteristics;
- New sub-clause 4.3 Added to clearly state Product Characteristic of Performance Under Impact;
- New sub-clause 4.4 Added to clearly state Product Characteristic of Constructional Integrity;
- 4) 5.2. Electrical safety: Addition detail added noting intended use of signal in a traffic system and that therefore electrical requirements of EN 50556 also apply;
- 5) 6.1 General: Text added noting that whilst it is normally expected that all aspects in a signal would be of the same performance, this can vary for special applications;
- 6) 6.3 Luminous Intensities: Allowance for dimming of signals added;
- 7) 6.4 Distribution of Luminous Intensity: Clarification added as to the meaning of the wording "substantially uniform" distribution;
- 8) 6.6 Phantom Signal: A note added;

9) 6.9 Background screen of signals: Simplified. Table 8 of background screen sizes removed and all subsequent tables re numbered (i.e. Tables 9 to 17 have become Tables 8 to 14);

10) 6.10 Visible Flicker: Characteristic and a note added;

11) 7 Construction and environmental test methods: Clarification added with reference to optical units of different diameters;

Table 9:- Class AJ2 replaced with duration and axis, as the AJ2 reference was a reference to EN 50556 simply for the duration and axis of the tests as the spectrum was always defined in EN 12368;

12) 8.1 General: Clarification of test tolerances added, optical measurement tolerances and measurement environment temperature tolerance;

13) 8.2 Measurement of luminous intensities: A method of stabilisation added;

14) 8.3. Measurement of luminance for uniformity tests: Method clarified;

15) 8.4. Measurement of phantom signal: specification for the illuminance source change to simplify the equipment needed;

16) 8.6. Measurement of combined colours: The need to plot colours on the chromaticity diagram Figure 3 clarified;

d) 10.1 Marking and labelling: The labelling needs changed increasing the level of information available adding diameter and dimming;

e) 10.2 Product Information: definition of reference axis clarified to include reference centre and the relationship to the light emitting surface. Need for instructions for safe use as required in the CPR article 11.6 also added to this sub-clause;

f) Clause 11: Clause updated to align with AVCP format for CPR. Table 15 removed as not part of the revised AVCP;

11.2.2. Test Modules: Definition expanded to cover alternative types of enclosures;

g) Table A.1: Dimmed operation added;

h) Annex ZA to align with Annex ZA format for CPR;

Table ZA.1: Scope increased to include dimming performance where signals have dimming and the possible use of hoods and visors where provided;

Table ZA.2: Intended uses expanded to indicate possible use of visors and hoods;

Figures ZA1: updated to show diameter and dimming performance.

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.

Introduction

Signal heads are mainly used to transfer safety messages to the road user to achieve specific reactions. Signal heads in road traffic transfer this information optically by signal lights which have a specific meaning and which differ in their colour of light and in the design of their illuminating surface.

The visibility of a signal light depends on the colour, luminous intensity, luminous intensity distribution, luminance and luminance uniformity, the surrounding luminance (background luminance), the size of the illuminating area of the signal light, the phantom light and the distance and angle between observer and signal head.

Four angular distributions of luminous intensities for signal lights are specified. The user can choose between an extra wide, wide, medium and narrow beam signal to obtain a good recognition of the signal for short distances in urban areas, for long distances in rural areas. To achieve a good performance the standard provides a number of different performance levels and two different diameters for the roundels.

This European Standard does not require limits for the recognition of red or green signals with reduced luminous intensities operating in a failure mode. These limits depend on the surrounding lights (on or off) and on the situation. However, for a simple rule a red signal is considered as failed if the luminous intensity in the reference axes is $I \leq 10$ cd, and a green signal is considered as being in operation if the luminous intensity is $I \geq 0,05$ cd.

The working environment for signal heads is relatively harsh and equipment that is deemed "fit for purpose" is expected to last in this exposed, corrosive environment for a minimum of 10 years. It is essential that all materials and manufacturing processes take this into account. The supplier should detail all steps taken to comply with this clause.

The optical performance of signal heads in use is a function of lens soiling, mirror soiling and a decrease of luminous flux from the lamp. To maintain the performance of the signal heads during service, it is important to ensure that after lamp replacement and cleaning of lens and mirror the light output is restored to as near 100 % as possible and never lower than 80 % of the declared specified performance(s).

For devices randomly selected from series production it is important that the product characteristic as to minimum luminous intensity of the light emitted, are in each relevant direction, of the minimum values prescribed.

1 Scope

This European Standard applies to signal heads with one or more signal lights of the colours red, yellow and/or green signal lights for road traffic with 200 mm and 300 mm roundels and to optical units to be integrated in signal heads to produce the individual signal lights. It defines the product characteristics for the visual, structural, environmental performances and testing of signal heads and optical units for pedestrian and road traffic use.

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 50293, *Electromagnetic compatibility — Road traffic signal systems — Product standard*

EN 50556, *Road traffic signal systems*

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

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

EN 60068-2-5, *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, *Environmental testing - Part 2-14: Tests - Test N: Change of temperature* (IEC 60068-2-14)

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

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

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

EN 60598-1:2008, *Luminaires - Part 1: General requirements and tests* (IEC 60598-1)

3 Terms and definitions

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

3.1

signal head

device which comprises one or more optical units, including the housing(s), together with all the mounting brackets, fixings, hoods, visors, cowls and background screens, whose task is to convey a visual message to vehicle and pedestrian traffic

3.2

optical unit

assembly of components designed to produce a light of the specified nominal size, colour, luminous intensity and shape