



SLOVENSKI STANDARD

SIST EN 14744:2005

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Plovila za celinsko in morsko plovbo - Navigacijska luč

Inland navigation vessels and sea-going vessels - Navigation light

Fahrzeuge der Binnen- und Seeschiffahrt - Navigationsleuchte

Bateaux de navigation intérieure et navires de haute mer - Eclairage de navigation

Ta slovenski standard je istoveten z: EN 14744:2005

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Inland navigation vessels and sea-going vessels - Navigation light

Bateaux de navigation intérieure et navires de haute mer -
Eclairage de navigation

Fahrzeuge der Binnen- und Seeschifffahrt -
Navigationsleuchte

This European Standard was approved by CEN on 8 July 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Contents

Page

Foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms, definitions and abbreviations.....	5
4 Minimum requirements.....	7
4.1 Luminous intensity and range.....	7
4.1.1 General.....	7
4.1.2 COLREGs.....	7
4.1.3 CCNR and CEVNI.....	7
4.2 Luminous intensity distribution.....	8
4.2.1 Horizontal luminous intensity distribution.....	8
4.2.2 Vertical luminous intensity distribution.....	8
4.3 Colorimetric requirements.....	8
4.3.1 General.....	8
4.3.2 COLREGs.....	9
4.4 Flashing light.....	10
4.5 Structural requirements.....	10
4.6 Fastening.....	11
4.7 Power supply.....	11
4.8 General requirements.....	11
4.8.1 General.....	11
4.8.2 Equipment category.....	11
4.8.3 Vibration.....	11
4.8.4 Rain and spray.....	11
4.8.5 Solar radiation.....	11
4.8.6 Corrosion (salt mist).....	11
4.8.7 Electromagnetic compatibility.....	11
4.8.8 Compass safe distance.....	12
4.8.9 Housing temperature.....	12
4.8.10 Mechanical shock.....	12
4.9 Electrical light sources.....	12
4.10 Other light sources, e.g. light emitting diodes (LED) and their particularities.....	12
4.10.1 Deviations caused by service life conditions.....	12
4.10.2 Influence of temperature.....	12
4.10.3 Pulse frequency.....	12
4.11 Holders for electrical light sources.....	13
4.12 Partially-screened navigation lights.....	13
5 Testing.....	13
5.1 General.....	13
5.1.1 Validity of EN 60945.....	13
5.1.2 Performance test and performance check.....	13
5.1.3 Pretreatment.....	13
5.1.4 Order of the tests.....	13
5.1.5 Documentation.....	13
5.2 Photometric and colorimetric tests.....	14
5.2.1 Test voltage.....	14
5.2.2 Photometric test.....	14
5.2.3 Colorimetric test.....	16
5.2.4 Measurement of luminous intensity and colour locus under the influence of temperature.....	18

5.2.5	Measurement of flashing lights.....	18
5.3	Explanations, supplements or amendments to points in EN 60945.....	19
5.3.1	Corrosion (salt mist).....	19
5.3.2	Extreme power supply.....	19
5.3.3	Dry heat.....	19
5.3.4	Damp heat.....	19
5.3.5	Vibration.....	19
5.3.6	Rain and spray.....	19
5.3.7	Solar radiation	20
5.3.8	EMC.....	20
5.4	Tests outside the scope of EN 60945.....	20
5.4.1	Shock	20
5.4.2	Enclosure temperature of electrically powered navigation lights	20
5.4.3	Mechanical tensile test on prehoistable navigation lights	20
6	Equipment manual.....	22
7	Marking	22
Annex A	(informative) Electrical light sources.....	23
A.1	Examples of electrical light sources.....	23
A.2	Incandescent lamps placed on the market for navigation lights.....	24
A.2.1	Types of construction	24
A.2.2	Lamp caps.....	26
Annex B	(informative) Instructions for the test laboratory	27
Annex C	(normative) COLREGs.....	33
C.1	Ranges and luminous intensities	33
C.2	Colour ranges	33
Annex D	(normative) CCNR and CEVNI.....	34
D.1	Ranges and luminous intensities	34
D.2	Colour ranges	34
Bibliography	35

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Foreword

This European Standard (EN 14744:2005) has been prepared by Technical Committee CEN/TC 15 "Inland navigation vessels", 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 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

CEN/TC 300 "Sea-going vessels and marine technology" supports this project.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard applies to requirements for navigation lights and their testing:

- a) for inland navigation and sea-going vessels;
- b) for recreational craft of 20 m and over;
- c) For recreational craft of less than 20 m that shall also meet the CEVNI rules.

This European Standard is not applicable to navigation lights on recreational craft less than 20 m in length that come within the scope just of COLREGs.

This standard specifies requirements for navigation lights cited in regulations, see Bibliography.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60945, *Maritime navigation and radiocommunication equipment and systems — General requirements — Methods of testing and required test results (IEC 60945:2002)*

CIE 15, *Colorimetry*

CIE 69, *Methods of characterizing illuminance meters and luminance meters — Performance, characteristics and specifications*

CIE 70:1987, *The measurement of absolute luminous intensity distributions*

ISO/CIE 10527, *CIE standard colorimetric observers*

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

COLREGs, *International Regulations for Preventing Collisions at Sea, 1972*

Provisions on the colour and luminous intensity of the on-board lights and the approval of signal lights in navigation on the Rhine of the Central Commission for Navigation on The Rhine (CCNR)

CEVNI, *Code Européen des Voies de Navigation Intérieure*

3 Terms, definitions and abbreviations

For the purposes of this European Standard, the following terms, definitions and abbreviations apply

3.1

navigation light

signal light

navigation lamp

apparatus with light source on water-borne vessels, recreational craft or on inland navigation and sea-going vessels for the distribution of light of specific colours and angles for the purpose of signalling

EN 14744:2005 (E)

- 3.2 navigation light**
signal light
light
light phenomena radiated by navigation lights
- 3.3 non-electrically powered navigation light**
light in which the light source is operated with propane or petroleum, for example
- 3.4 range**
distance from which the light of the navigation light may be seen
- 3.5 zero signal direction**
horizontal direction of radiation of a navigation light in the centre-line plane or parallel to it, designated in this standard either as 0° or “dead ahead”
- 3.6 light source**
system for generating light in a navigation light
- 3.7 double-deck navigation light**
two navigation lights arranged in an enclosure one above the other
- 3.8 partially-screened navigation light**
two navigation lights with horizontal beam sectors that combine to give an overall sector $\geq 360^\circ$
- 3.9 flashing light**
sequence of regular light phenomena per unit of time
- 3.10 reference circle light**
navigation light with radiation range of $< 360^\circ$
- 3.11 abbreviations**
- | | |
|---------|--|
| CCNR | Central Commission for Navigation of the Rhine |
| CIE | International Commission on Illumination |
| CEVNI | Code européen des voies de navigation intérieure |
| COLREGs | International Regulations for Preventing Collisions at Sea, 1972 |
| IMO | International Maritime Organization |
| LED | Light Emitting Diode |
| MED | Marine Equipment Directive |

4 Minimum requirements

4.1 Luminous intensity and range

4.1.1 General

I_0 is the photometric luminous intensity in candela (cd) that, in the case of navigation lights with an electrical light source, is measured in the laboratory at rated voltage.

Taking into account the ageing of the light source, contamination of the optical system and voltage fluctuations of the vessel power supply system, for example, the luminous intensity under operating conditions I_B in candela (cd), for the values listed in the COLREGs is assumed to be 20 % less than the photometric luminous intensity I_0 .

Therefore, $I_B = 0,8 \times I_0$ (cd)

Where

I_B is the luminous intensity under operating conditions, in candela (cd)

I_0 is the photometric luminous intensity, in candela (cd)

The range given on the navigation light depends on the interval for I_0 in Table 1 in which the luminous intensity I_0 actually measured lies. It is not permitted to mark a navigation light with a higher or lower figure.

Table 1 — Range, luminous intensities and range designations

Nominal size is the range of the navigation lights	Minimum range value		Maximum range value		Operational luminous intensity (I_B)	Minimum photometric luminous intensity (I_0) to be measured in the laboratory	Maximum photometric luminous intensity (I_0) to be measured in the laboratory	Other range designation (CCNR, CEVNI)
	nm	km	nm	km				
1	1	1,85	2	3,70	0,9	1,1	5,4	Normal
2	2	3,70	5	9,26	4,3	5,4	65	Bright
3	3	5,56	5	9,26	12	15	65	Bright
5	5	9,26	7,5	13,9	52	65	257	Intense
6	6	11,11	7,5	13,9	94	118	257	Intense

If the luminous intensity of a navigation light is within the ranges specified in Table 1 for I_0 , the COLREGs, CCNR and CEVNI requirements may be considered to have been met.

4.1.2 COLREGs

If the range of the navigation light is intended to meet only the COLREGs, the luminous intensities in Table C.1 of normative Annex C apply instead of Table 1.

4.1.3 CCNR and CEVNI

If the range of the navigation light is intended to meet only the CCNR and CEVNI regulations, the luminous intensities in Table D.1 of normative Annex D apply instead of Table 1.

EN 14744:2005 (E)

4.2 Luminous intensity distribution

4.2.1 Horizontal luminous intensity distribution

The requirements of the COLREGs apply.

According to the COLREG "almost zero" means a value of not greater than 10% of the photometric luminous intensity I_0 measured in the zero signal direction (3.5) (dead ahead direction).

In the case of two-colour or three-colour navigation lights, the luminous intensity distribution shall be uniform so that in the range of 3° on each side of the zero signal, the maximum permissible luminous intensity shall not be exceeded and the minimum required luminous intensity shall not be fallen short of.

The horizontal luminous intensity distribution of the navigation light shall be uniform over the whole radiation angle so that the maximum and minimum values of the photometric luminous intensity do not differ by more than a factor of 1,5. The luminous intensities of the starboard and port lights shall not differ by more than a factor of 1,5.

4.2.2 Vertical luminous intensity distribution

The requirements of the COLREGs apply.

The maximum vertical luminous intensity shall not exceed the horizontal luminous intensity at 0° by more than a factor of 1,5. Navigation lights with vertical luminous intensity distribution according to COLREGs, Annex I, 10 (a) specified for motor boats only shall be marked accordingly (three-bladed propeller).

4.3 Colorimetric requirements

4.3.1 General

The colour ranges given in Table 2 apply.

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Table 2 — Colour range vertices

Signal light colour	Coordinates of the vertices						
	x	y	z	x	y	z	x
White	x	0,310	0,443	0,500	0,500	0,453	0,310
	y	0,283	0,382	0,382	0,440	0,440	0,348
Red	x	0,690	0,710	0,680	0,660		
	y	0,290	0,290	0,320	0,320		
Green	x	0,009	0,284	0,207	0,013		
	y	0,720	0,520	0,397	0,494		
Yellow	x	0,612	0,618	0,575	0,575		
	y	0,382	0,382	0,425	0,406		
Blue	x	0,136	0,218	0,185	0,102		
	y	0,040	0,142	0,175	0,105		

If the colour locus of a navigation light is within the coordinates specified in Table 2, the COLREGs, CCNR and CEVNI requirements relating to colour loci are satisfied.

NOTE The table corresponds to that in CIE No. 2.2 (TC – 1.6) – 1975; CIE S 004/E – 2001 "Colours of light signals" published by the CIE in 2001 was not regarded as being suitable.

4.3.2 COLREGs

If the colour locus is intended to meet the requirements of the COLREGs only, the colour ranges in Table C.2 in normative Annex C apply instead of Table 2.

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EN 14744:2005 (E)

4.4 Flashing light

The ruling dimension for the range is the visually effective luminous intensity (I_{EFF}). I_{EFF} is a measure for the conspicuity and efficiency of the flashing light emitted.

I_{EFF} shall attain at least the minimum horizontal photometric luminous intensity values I_0 in Table 1.

I_{EFF} is calculated as follows from the maximum instantaneous luminous intensity in the observation direction (I_{MAX}) according to the Blondel-Rey equation:

$$I_{EFF} = \frac{\int_{t_1}^{t_2} I_{MAX} dt}{0,2 + (t_2 - t_1)}$$

Where

I_{EFF} is the effective luminous intensity in candela;

I_{MAX} is the instantaneous value in candela;

0,2 is the Blondel-Rey constant for night observation in seconds;

t_1 and t_2 are the integration time limits in seconds.

If the duration of the light phenomenon less the rise time and decay time, i.e. the time in which the instantaneous luminous intensity attains or exceeds the required minimum luminous intensity, is greater than 0,3 s, the light may be regarded as a steady light. The effective luminous intensity shall not then be determined.

Table 3 — Number of regular light phenomena of flashing lights

Designation	Area	Number of regular light phenomena per minute	
		min.	max.
Flashing light	CCNR, CEVNI	40	60
Quick flashing light	CCNR, CEVNI	100	120
Flashing light	COLREGs	120	—

The luminous intensity ranges and colour ranges in 4.1 and 4.3 apply, but without the upper limit for the luminous intensity.

The vertical radiation shall be at least 4°.

With an inclination of the flashing light to the horizontal of up to $\pm 2^\circ$, the luminous intensities shall still be at least 80 % of the luminous intensity at 0°.

4.5 Structural requirements

4.5.1 Prehoistable navigation lights shall be fitted with an adequate strain-relief device for the supply cable that shall withstand a tensile load of at least 50 N.

4.5.2 In the case of prehoistable navigation lights, the tensile loading shall be tested as described in 5.4.3.

4.5.3 Electrical safety

The electrical safety shall be ensured as described in EN 60945