

SVENSK STANDARD

SS-EN 12193:2007

Fastställt/Approved: 2007-12-27
Publicerad/Published: 2008-01-17
Utgåva/Edition: 2
Språk/Language: engelska/English
ICS: 97.220.10; 94.100; 91.160.01

Ljus och belysning – Sportbelysning

Light and lighting – Sports lighting



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Denna standard ersätter SS-EN 12193, utgåva 1.

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This standard supersedes the Swedish Standard SS-EN 12193, edition 1.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12193

December 2007

ICS 91.160.01; 97.220.10

Supersedes EN 12193:1999

English Version

Light and lighting - Sports lighting

Éclairagisme - Éclairage des installations sportives

Licht und Beleuchtung - Sportstättenbeleuchtung

This European Standard was approved by CEN on 25 October 2007.

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 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 Management Centre has the same status as the official versions.

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Foreword

This document (EN 12193:2007) has been prepared by Technical Committee CEN/TC 169 "Light and lighting", 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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

This document supersedes EN 12193:1999.

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

Introduction

This European standard deals with sports lighting to ensure good visual conditions for players, athletes, referees, spectators and CTV transmission. The objective of this document is to provide recommendations and specify requirements for good quality sports lighting by:

- optimising the perception of visual information used during sports events;
- maintaining the level of visual performance;
- providing acceptable visual comfort;
- restricting obtrusive light.

1 Scope

This standard specifies lighting for those indoor and outdoor sports events most practised in Europe. It provides lighting values for the design and control of sports lighting installations in terms of illuminances, uniformity, glare restriction and colour properties of the light sources. All requirements are meant to be as minimum requirements. It also gives methods by which these values are measured. For the limitation of glare, it also points out restrictions on the location of the luminaires for specific applications.

For emergency lighting this standard refers to the requirements of EN 1838.

2 Normative references

The following referenced documents are indispensable for the application 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 12464-1, *Light and lighting – Lighting of work places – Part 1: Indoor work places*

EN 12665:2002, *Light and lighting – Basic terms and criteria for specifying lighting requirements*

EN 13032-1, *Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 1: Measurement and file format*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12665:2002 and the following apply.

3.1

principal area

PA

actual playing area needed for the performance of a certain sport

NOTE 1 Usually this means the actual marked out "field" area for that sport (for instance football), but in some cases this area comprises an extra playing area around the marked area (e. g. tennis, volleyball, table tennis).

NOTE 2 In all tables in Annex A examples of area sizes are given which are most commonly used for that sport. The particular area dimensions should be checked at the time when designing a lighting installation.

3.2

total area

TA

area generally comprising the principal area (PA) plus an additional safety area outside the principal area

3.3

reference area

area defined per sports on which the main lighting requirements apply including the marking lines and any extra area centred around the marked area

NOTE The dimensions of this area are generally based on PA, for the relevant sport and level of competition. For most sports this reference area is limited by a rectangle in the horizontal plane of the ground. An example of reference area is given in Figure 1 where l and w stand respectively for the length and the width of the rectangular reference area. Where a total area (TA) is specified, it will also be necessary to fulfil the requirements as defined in 5.3 a).

3.4 grid points for measurement and calculation

arrangement of calculation and measurement points and their number in each dimension of the reference area

NOTE 1 When the reference area is rectangular, l_p and w_p (see Figure 1) define the dimensions of the rectangle limited by the four corner points which are common for calculation and measurement.

NOTE 2 When the reference area covers a symmetrical track, l will be l_p , which is the quarter of the length of the inner limit of the track, w the width of the track as defined in Figure 2.

3.5 obtrusive light

spill light which because of quantitative, directional or spectral attributes in a given context gives rise to annoyance, discomfort, distraction or reduction in the ability to see essential information.

NOTE In the case of outdoor sports lighting installation obtrusive light is considered around the installation and not for spectators, referees or players within the sports area.

3.6 curfew

time after which stricter requirements (for the control of obtrusive light) will apply

NOTE It is often a condition of use of lighting applied by a government controlling authority, usually the local government.

3.7 average illuminance over a surface

3.7.1 maintained average illuminance over a surface

value below which the average illuminance on the specified surface is not allowed to fall

NOTE It is the average illuminance on the specified surface at the time maintenance must be carried out

3.7.2 initial average illuminance over a surface

average illuminance on the specified surface when the installation is new

NOTE The initial average illuminance is obtained from the specific maintained value by dividing the latter value by the maintenance factor at the time maintenance must be carried out.

4 Data to be provided

4.1 Essential lamp data

4.1.1 General

The following lamp data shall be provided for verification.

4.1.2 Lamp code

Any combination of letters and numbers by which the lamp type can be identified.

4.1.3 Lamp dimensions

All dimensions of the lamp that are relevant for the luminaire.

4.1.4 Nominal lamp wattage (W_{lamp})

The nominal lamp wattage (W_{lamp}) as the approximate wattage used to designate or identify the lamp may be stated.

4.1.5 Luminous Flux

4.1.6 Lamp lumen maintenance factor (LLMF)

NOTE The lamp lumen maintenance factor may be presented as a graph or as data in a table. However, for the designer to set up an optimal maintenance scheme, it is recommended to present these data in tabular form.

4.1.7 Lamp survival factor (LSF)

NOTE The lamp survival factor may be presented as a graph or as data in a table. However, to allow the designer to set up an optimal maintenance scheme, it is recommended to present these data in tabular form.

4.1.8 General colour rendering index (R_a)

4.1.9 Correlated colour temperature (T_{cp})

4.2 Useful lamp data

4.2.1 General

Lamp data beneficial to the designers and users in the planning and operation of lighting installations

4.2.2 Lamp energy efficiency class (LEEC)

Lamp energy efficiency class assigned to the lamp in accordance with the energy efficiency index defined in the Lamps Directive 98/11/EC and measured in accordance to EN 50285.

4.3 Essential luminaire data

4.3.1 General

Luminaire data required for verification of conformity to the requirements of EN 12193.

4.3.2 Luminaire code

Any combination of letters and numbers by which the luminaire type is identified.

4.3.3 Normalised Intensity Table

In sports lighting designs, the accuracy of illuminance calculations is based primarily upon the quality of interpolation within the intensity table of the luminaires used. For minimum requirements see EN 13032-1.

4.3.4 Correction factors

When the electrical performance of the ballast, used in the photometric measurements, deviates more than 5 % from the standard measurement, then a Ballast Lumen Factor (BLF) shall be specified.

4.3.5 Dimensions of the luminous parts of the luminaire

The dimensions of those parts of the luminaire from which light is emitted shall be given in m or m².