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Ljus och belysning – Sportbelysning

Light and lighting – Sports lighting

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Europastandarden EN 12193:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 12193:2018.

Denna standard ersätter SS-EN 12193:2007, utgåva 2.

The European Standard EN 12193:2018 has the status of a Swedish Standard. This document contains the official version of EN 12193:2018.

This standard supersedes the SS-EN 12193:2007, edition 2.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Ljus och belysning, SIS/TK 380/AG 03.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12193

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Supersedes EN 12193:2007

English Version

Light and lighting - Sports lighting

Lumière et éclairage - Éclairage des installations sportives

Licht und Beleuchtung - Sportstättenbeleuchtung

This European Standard was approved by CEN on 1 July 2018.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

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European foreword

This document (EN 12193:2018) 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 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12193:2007.

In this revision the main technical changes can be divided between the needs of the players and that of the camera. For the players the minimum colour rendering index has been increased from $R_a > 20$ to $R_a > 60$. The tables of requirements have been updated to take into account sports that have become popular since the last edition. Recommendations on the use of Glare Rating for indoor sports areas are now included.

The requirements for television and film recording have been revised to reflect changes in broadcast technology since the last edition. Lighting levels have been reviewed in line with the requirements for HD and 4K transmission as well as production techniques. For cameras colour rendering index has been replaced by Television Lighting Consistency Index (TLCI) which has been developed specifically for broadcast cameras. Requirements for eliminating flicker from slow motion cameras are included as well as lighting of spectators.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the 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:

— optimizing 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 document specifies lighting for those indoor and outdoor sports events most practised in Europe. This document only considers artificial lighting. 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 intended 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 document refers to the requirements of EN 1838.

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 1838, *Lighting applications — Emergency lighting*

EN 12665:2011, *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 12665:2011 and the following apply.

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

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

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

3.1
principal area
PA
actual playing area needed for the performance of a certain sport

Note 1 to entry: 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 to entry: 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

Note 1 to entry: 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 a 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 7.1 a).

3.3
grid points for measurement and calculation
arrangement of calculation and measurement points and their number in each dimension of the reference area

Note 1 to entry: When the reference area is rectangular, *l* and *w* (see Figure 1) define the dimensions of the rectangle limited by the four corner points which are common for calculation and measurement.

Note 2 to entry: When the reference area covers a symmetrical track, is *l* a quarter of the length of the inner limit of the track and *w* the width of the track as defined in Figure 2.

3.4
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 information that is critical to the visual task

Note 1 to entry 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.

[Source: EN 12665:2018, 3.2.46, modified]

3.5
curfew sports lighting
time after which stricter requirements (for the control of obtrusive light) will apply

[Source: see CEN/CENELEC Internal Regulations Part 3:2015, D.1.5.]

Note 1 to entry: It is often a condition of use of lighting applied by a government controlling authority, usually the local government.

3.6
average illuminance over a surface
illuminance averaged over the specified surface

[Source: EN 12665:2018, 3.2.11, modified]

Note 1 to entry: Horizontal illuminance calculated at ground level (0 m) and vertical illuminance calculated at a height of 1,5 m, unless stated otherwise.

3.6.1
maintained average illuminance over a surface
value below which the average illuminance on the specified surface is not allowed to fall

Note 1 to entry: It is the average illuminance on the specified surface at the time maintenance is to be carried out.

3.6.2
initial average illuminance over a surface
average illuminance on the specified surface when the installation is new