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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Technical requirements for the application of LED sports
lighting**

LED体育照明应用技术要求

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1 Scope

China's national technical requirements for LED sports lighting. It specifies the terms and definitions, the general requirements and the classification of specifications. Sports lighting is the most demanding of all outdoor lighting applications, and the reason is television. A pitch lit adequately for players is nowhere near adequate for a broadcast camera, which needs several times the illuminance, needs it uniform across the field and vertically as well as horizontally so that faces are lit, and needs it free of flicker - which is where LED sports lighting differs sharply from the metal halide it replaced. A metal halide lamp has thermal inertia that smooths the mains cycle; an LED driver does not, and a super slow motion camera at a thousand frames a second will show banding or pulsing that is invisible to the eye. The requirements on driver flicker are therefore as important as those on illuminance and glare.

This Standard specifies terms and definitions, general requirements, specification classification requirements and performance requirements for luminaires, driving power supplies and lighting control systems of LED for stadium sports lighting. This Standard is applicable to LED luminaires, driver and lighting control system as well as their applications for stadium and auditorium lighting.

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.

GB 7000.1, Luminaires - Part 1: General requirements and tests

GB 7000.7, Safety requirements for floodlights

GB 7000.218, Luminaires - Part 2-18: Particular requirements - Luminaires for swimming pools and similar application

GB/T 7921-2008, Uniform color space and color difference formula

GB/T 9254, Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

GB 17625.1-2012, Electromagnetic compatibility - Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

GB/T 17626.5-2019, Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test

GB/T 17743, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

GB/T 18595, Equipment for general lighting purposes - EMC immunity a visual phenomenon that causes uncomfortable feeling or reduces the ability to observe details or objects due to the inappropriate brightness distribution or brightness range in the field of view, or the existence of extreme contrast [JGJ/T 119-2008, definition 2.2.17]

3.6 colour rendering index measurement of light source color rendering, expressed by the degree of agreement between the color of the object under the measured light source and the color of the object under the reference light source [JGJ/T 119-2008, definition 2.3.28]

3.6.1 general colour rendering index; R_a the average value of the color rendering index of the light source to the 1st ~ 8th standard color samples specified by the International Commission on Illumination (CIE)

3.6.2 special colour rendering index; R_i the color rendering index of the light source for the 9th ~ 15th standard color samples selected by the International Commission of Illumination (CIE) NOTE: In this Standard, R_9 refers to the color rendering index of the light source for the 9th standard color sample selected by the International Commission on Illumination (CIE).

3.7 colour temperature when the chromaticity of the light source is the same as the chromaticity of a black body at a certain temperature, the absolute temperature of the black body is the color temperature of the light source; color temperature is used to express how warm (red) or cold (blue) a kind of lighting feels or the apparent feeling [JGJ/T 119-2008, definition 2.3.21]

7.4 Durability

7.4.1 When the maximum temperature of the housing does not exceed 75°C, the life of the driver for LED lighting shall not be less than 50000h.

7.4.2 Under the working conditions specified in 7.1.2, the failure rate of driver for LED lighting shall not exceed 0.5%.

7.4.3 The product shall be able to work normally after 500h durability test at high temperature (85°C).

8.1 Basic requirements

8.1.1 It shall be able to perform single luminaire, group or zone control of lighting fixtures according to functional requirements.

8.1.2 There shall be an open communication interface and protocol.

8.1.3 It shall be able to achieve control functions through data collection and analysis, automatic function presets, in accordance with the following regulations:

- a) It shall be able to realize switch control according to the requirements;
- b) In places where dimming is required, the illuminance (brightness) shall be adjusted according to the set value;
- c) In places where scene switching is required, the set scene mode shall be able to be switched according to the stated requirements, and on-site adjustments shall be possible.

8.1.4 When the control system fails, it shall be able to automatically send out audible and visual alarm signals, and meet the following requirements:

- a) It shall support the offline alarm of the control module and the gateway module AND the feedback of the inconsistent control and status;
- b) When a communication failure occurs, the system input and output equipment shall be able to operate according to the preset program; systems.

8.2.3 LED luminaires for natural lighting shall be equipped with a smart sensor or an external sensor control interface that automatically adjusts the illuminance according to natural light changes.

8.2.4 The LED venue lighting control system shall determine the network structure of the control system according to the scale and needs of the competition venue. And through the network integrated equipment management system, it can collect and control the lighting operating status.

8.2.5 The architecture of the LED intelligent lighting control system shall refer to Annex G to determine. The communication protocol and system configuration shall refer to Annex H to

determine.

8.3 Dimming requirements

8.3.1 When the control system is used for TV relay lighting, it is not advisable to use dimming method for lighting scene changes. When using the dimming method, the following requirements shall be met:

- a) The upper limit of the luminous flux of the light source shall not be higher than the rated luminous flux;
- b) When adjusting the brightness or illuminance, the color temperature deviation shall not exceed 200K;
- c) The dimming shall meet the requirements for the stroboscopic limit;
- d) The dimming shall be realized by adjusting the output current value.

8.3.2 It shall meet linear dimming requirements. The deviation of the actual luminous flux output from the set value shall not exceed 10%.