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

GB 30255-2019

Replacing GB 30255-2013

**Minimum allowable values of energy efficiency and energy
efficiency grades of LED products for indoor lighting**

室内照明用LED产品能效限定值及能效等级

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Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009. This Standard integrates the relevant content of non-directional self-ballast LED lamp; replaces GB 30255-2013 "Minimum allowable values of energy efficiency and energy efficiency grades of non-directional self-ballasted LED-lamps for general lighting services". Compared with GB 30255-2013, the main technical changes are as follows: - In the Scope, specify that "This Standard does not apply to indoor lighting LED products with energy-consuming non-lighting additional functions or dimming/toning functions"; - Modify the luminous efficacy index values of each grade of non-directional self-ballast LED lamps (see 4.1.4); - Modify the technical requirements for lumen maintenance (see 4.4); - ADD test methods for correlated color temperature, color rendering index, and lumen maintenance (see 5.3). This Standard was proposed by and shall be under the jurisdiction of Standardization Administration of the PRC. Drafting organizations of this Standard: China National Institute of Standardization, Guangdong Dongguan Quality Supervision Testing Center, Shanghai Feilo Acoustics Co., Ltd., Osram (China) Lighting Co., Ltd., Shenzhen Eastfield Lighting Co., Ltd., Hengdian Group Tospo Lighting Co., Ltd., Xiamen Topstar Lighting Co., Ltd., Foshan Electrical and Lighting Co., Ltd., Panasonic Manufacturing (Beijing) Co., Ltd., Shanghai Semiconductor Lighting Engineering Technology Research Center, Philips Lighting (China) Investment Co., Ltd., Shenzhen Spark Co., Ltd., Panasonic R&D Center Suzhou Co., Ltd., Zhejiang Hpwinner Opto Co., Ltd., Hangzhou Woojong Group, Ningbo Yamao Optoelectronics Co., Ltd., Shenzhen Fluence Technology PLC, Beijing Institute of Metrology, Loyal Lighting Co., Ltd., Dongguan Bai Fen Bai Technology Co., Ltd. Main drafters of this Standard: Ding Qing, Liang Xiuying, Zhao Yuejin, Chen Haihong, Gu Liwen, Tong Min, Zhang Junbin, Cao Xiaobing, Nie Lixun, Liao Guochun, Wei Bin, Zhao Zhenyu, Yang Jiexiang, Ni Wei, Li Benliang, Zhou Qifeng, Dai Xin, Chen Songbo, Li Yan, Liu Meng, Liu Ren, Huang Jianming, Zhang Linfu, Cao Maojun, Liu Weihong, Jia Yaqing, Zhou Jiaxiang, Yang Songbing. Minimum allowable values of energy efficiency and energy efficiency grades of LED products for indoor lighting

1 Scope

China's mandatory energy efficiency standard for indoor LED lighting products - the lamps and luminaires that displaced the fluorescent tube and the compact fluorescent, and which now account for most of the lighting sold. It specifies the energy efficiency grades, the minimum allowable values of energy efficiency, the energy conservation evaluation values, the test methods and the inspection rules for LED products used in indoor lighting. The efficiency is expressed as the initial luminous efficacy in lumens per watt of the whole product - lamp or luminaire, including its driver - tabulated by product type, by correlated colour temperature and by colour rendering index. That last dimension is the one that makes this standard harder than the fluorescent standard it replaced. Efficacy, colour rendering and colour temperature trade against each other in an LED: a warm lamp with a high colour rendering index is inherently less efficacious than a cold one with poor rendering, and a single efficacy table across all of them would have pushed the market toward cold, badly rendering light that people dislike and eventually replace. Grading by colour temperature and rendering index avoids that, and it is the reason the tables are as long as they are. Alongside the efficacy the standard sets the lumen maintenance, because an LED product does not fail, it fades: a lamp that meets its efficacy on the first day and has lost a third of its output after a year has not delivered what was paid for, and without a maintenance requirement the efficacy figure alone can be met with a driver run too hard. Issued on 4 April 2019 and in force since 1 May 2020, it replaces GB 30255-2013; a new edition, GB 30255-2026, has since been issued.

This Standard specifies the energy efficiency grades, minimum allowable values of energy efficiency, color rendering index, lumen maintenance, and test methods for LED downlights, directional integrated LED lamps, and non- directional self-ballast LED lamps for indoor lighting. This Standard applies to LED downlights with LED as the light source, power supply voltage not exceeding AC 250 V, frequency

50 Hz, rated power 2 W and above, beam angle $>60^\circ$, excluding LED downlights using integrated LED lamps. This Standard applies to directional integrated LED lamps of PAR16, PAR20, PAR30, PAR38 series with the rated power supply voltage of AC 220 V, frequency

50 Hz, the lamp holder meeting the requirements of GU10, B22, E14, or E27. This Standard applies to non-directional self-ballast LED lamps with rated supply voltage of AC 220 V, frequency of

50 Hz, rated power greater than or equal to 2 W, less than or equal to 60 W, excluding non-directional self-ballast LED lamps with additional optical lens design. This Standard does not apply to indoor lighting LED products with energy- consuming non-lighting additional functions or dimming/toning functions.

2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 24824 Measurement methods of LED modules for general lighting

GB/T 24826 General lighting - Light emitting diode (LED) products and related equipment - Terms and definitions integrated LED lamps is Grade 3 in Table 2.

4.2.3 The minimum allowable value of energy efficiency for non-directional self-ballast LED lamps is Grade 3 in Table 3.

4.3 Color rendering index The initial general color rendering index R_a of LED downlights, directional integrated LED lamps, and non-directional self-ballast LED lamps shall not be lower than 80. R_9 shall be greater than 0. The decrease in the measured value of the color rendering index relative to the rated value shall not be greater than 3.

4.4 Lumen maintenance The lumen maintenance of LED downlights, directional integrated LED lamps, and non-directional self-ballast LED lamps at 3000 h shall not be lower than the required lumen maintenance associated with the rated life. According to the claimed rated life, the required value of lumen maintenance shall be calculated according to formula (1). Where: LM - Lumen maintenance; t_0 - Rated life, in hours (h).

5 Test methods

5.1 LED downlight The luminous efficacy, correlated color temperature, and color rendering index of LED downlights shall be tested in accordance with the test methods specified in GB/T 29293. Based on whether the LED downlight uses an LED package with the LM-80 test report, determine the applicable lumen maintenance test method: When the LED downlight uses an LED package with the LM-80 test report, after the parameters corresponding to the report are tested, calculated, and verified compliant, the 3000 h lumen maintenance of the LED package in the test report can be used as the 3000 h lumen maintenance of the LED downlight. If verified non-compliant or the LED downlight does not use an LED package with the LM-