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Minimum allowable values of energy efficiency and energy efficiency grades of LED flat panel luminaires

普通照明用LED平板灯能效限定值及能效等级

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Standardization Administration of China

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed and managed by the National Standardization Management Committee. Drafting organizations of this standard. China National Institute of Standardization, Xuyu Optoelectronics (Shenzhen) Co., Ltd., Xiamen Topstar Lighting Co., Ltd., Europe General Lighting Co., Ltd., Foshan Institute of Science and Technology, Shenzhen Yufu Lighting Co., Ltd., Chenhui Lite-On Technology Co., Ltd., Panasonic Electric Machinery (Beijing) Co., Ltd., Foshan Electric Lighting Co., Ltd., Signify (China) Investment Co., Ltd., Osram (China) Ming Co., Ltd., Ningbo Luke Electric Co., Ltd., Huizhou NVC Optoelectronics Technology Co., Ltd., Zhejiang Sunshine Lighting Electric Co., Ltd. Company, Zhejiang Kaiyao Lighting Co., Ltd., Kunshan Chengtai Electric Co., Ltd., Chengshan Group Co., Ltd. The main drafters of this standard. Liang Xiuying, Lin Jintian, Zhou Ding, Chen Songbo, Cao Xiaobing, Guo Pengxin, Zhao Zhenyu, Wei Bin, Zhang Junbin, Ni Wei, Zhu Feibiao, He Feilong, Zheng Dong, Cai Hong, Xu Qian, Sheng Yulin, Dong Yongyang, Ding Qing, Peng Yanyan, Zhang Siman, Zhao Yuejin. Energy efficiency limit values and energy efficiency grades of LED panel lights for general lighting

1 Scope

China's mandatory energy efficiency standard for LED flat panel luminaires - the recessed and surface panels that replaced the recessed fluorescent troffer in offices, schools, hospitals and shops, and which are now the default general lighting of any commercial interior. It specifies the energy efficiency grades, the minimum allowable values of energy efficiency and the test methods for LED flat panel luminaires used in general lighting. It applies to the luminaires using LED as the light source, at a rated voltage of 220 V and a frequency of 50 Hz, with a thickness not exceeding 85 mm. The efficiency is expressed as the luminous efficacy of the complete luminaire in lumens per watt, tabulated by correlated colour temperature and colour rendering index. Measuring the whole luminaire rather than the LED module inside it is the substantive decision: a panel is a diffuser, a light guide, a

heat path and a driver as well as a set of LEDs, and a good part of the light produced never leaves the fitting. A standard written on module efficacy would reward a manufacturer for putting efficient LEDs behind a poor optic, which is exactly the product this standard is meant to exclude. Alongside the efficacy the standard sets the lumen maintenance, because a panel is installed in a ceiling and is not looked at again for years: it does not fail, it dims, and without a maintenance requirement the efficacy figure can be met by running the driver harder at the cost of the life. The minimum allowable value is the threshold below which a panel may not be manufactured, imported or sold, and the grades are what appears on the label. Issued on 31 December 2019 and in force since 1 January 2021.

This standard specifies the energy efficiency grades, energy efficiency limit values and test methods of LED flat lights for general lighting. This standard is applicable to general lighting with LED as light source, rated voltage 220V, frequency 50Hz, and thickness not exceeding 85mm LED flat light, including LED light source and its control device, the thickness of the external control device is not calculated in the thickness of the lamp. This standard does not apply to LED flat lights with energy-consuming non-lighting additional functions, and LED flat lights with dimming/color adjustment functions. And LED flat lights with colors, patterns or decorations on the continuous light-emitting surface.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this document. For undated references, the latest version (including all amendments) applies to this document.

GB/T 24826 Terms and definitions for LED products and related equipment for general lighting

GB/T 31897.201 Lamp Performance Part 2-

3 Terms and definitions

The following terms and definitions defined in GB/T 24826 apply to this document.

3.1 LED flat light A thin luminaire that uses LED as the light source and only emits downward light. Its light-emitting surface is a regular square, rectangular or circular continuous plane, long and wide The ratio is not more than 5 and the maximum side length or diameter is not less than 270mm.

3.2 LED panel lighting effect Under the test conditions specified in the standard, the ratio of the initial luminous flux emitted by the LED panel light to the input power.

3.3 LED flat light energy efficiency limit value Under the test conditions specified in the standard, the minimum allowable value of LED panel lighting effect.

4 Technical requirements

4.1 Energy efficiency rating The energy efficiency of LED panel lights is divided into 3 levels, of which level 1 has the highest energy efficiency. The lighting effect of each grade of LED flat panel shall not be lower than the regulations in Table 1.

4.3 Color rendering index The general color rendering index Ra of LED flat lights should not be less than 80, and the initial measured value of Ra should not decrease more than 3 relative to the rated value. The measured value of initial special color rendering index R9 should be greater than 0.

4.4 Luminous flux maintenance rate The luminous flux maintenance rate of the LED panel lamp at 3000h should not be lower than the required value of the luminous flux maintenance rate related to the rated life. Luminous maintenance The required value of the rate should be calculated according to formula (1).

5 Test method

5.1 Light efficiency, correlated color temperature and color rendering index The LED panel lighting efficiency, correlated color temperature and color rendering index shall be tested in accordance with the test methods specified in GB/T 31897.201.

5.2 Lumen maintenance rate Determine the applicable test method according to whether the LED flat light uses the LED package with the LM-80 test report. When the LED flat light uses an LED package with an LM-80 test report, the parameters corresponding to the report are tested and calculated to verify that they are in compliance. The 3000h lumen maintenance rate data of the LED package in the test report can be used as the 3000h lumen maintenance rate of the lamp. If the verification does not meet Or the LED flat light does not use the LED package with LM-80 test report, it should be in accordance with the test method specified in GB/T 31897.201 Test the luminous flux maintenance rate.