



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

GB 55015-2021

standard for lighting design of buildings

建筑节能与可再生能源利用通用规范

(English Translation)

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1 General

1.0.1

In order to implement national laws and regulations on energy conservation, ecological environment protection, and climate change response, implement carbon peaking, carbon neutral decision-making and deployment, improve energy resource utilization efficiency, promote renewable energy utilization, and reduce building carbon emissions, Create a good building indoor environment to meet the needs of high-quality economic and social development, and formulate this specification.

1.0.2

The design, construction, acceptance and operation management of building energy-saving and renewable energy building application systems for newly-built, expanded and rebuilt buildings as well as existing building energy-saving renovation projects must implement this specification.

1.0.3

Building energy conservation should be based on the premise of ensuring the indoor environmental parameters and functions necessary for life and production, and follow the principle of giving priority to passive energy conservation measures. Natural lighting and natural ventilation should be fully utilized to improve the thermal insulation performance of

the enclosure structure, improve the energy utilization efficiency of building equipment and systems, and reduce the energy demand of buildings. Renewable energy should be fully utilized to reduce the consumption of building fossil energy.

1.0.4

Whether the technical methods and measures adopted in the project construction meet the requirements of this specification shall be judged by the relevant responsible parties. Among them, innovative technical methods and measures should be demonstrated and meet the performance requirements in this specification.

2 Basic rules

2.0.1

The average design energy consumption level of new residential buildings and public buildings should be reduced by 30% and 20% respectively on the basis of the energy-saving design standards implemented in 2016. The average energy saving rate in different climate zones shall meet the following requirements.

- 1 The average energy saving rate of residential buildings in severe cold and cold regions should be 75%;
- 2 Except for severe cold and cold regions, the average energy saving rate of residential buildings in other climate zones shall be 65%;
- 3 The average energy saving rate of public buildings should be 72%.

2.0.2

Under standard working conditions, the average energy consumption indicators of various new buildings in different climate zones shall be determined in accordance with Appendix A of this code.

2.0.3

The carbon emission intensity of newly built residential and public buildings should be reduced by an average of 40% on the basis of the energy-saving design standards implemented in 2016, and the carbon emission intensity should be reduced by an average of more than 7kgCO₂/(m²·a).

2.0.4

The overall planning of new buildings and buildings should create conditions for the utilization of renewable energy, and should be conducive to increasing sunlight and reducing the impact of cold wind on buildings in winter, enhancing natural ventilation and reducing heat island effect in summer.

2.0.5

Building energy-saving design should be carried out for newly-built, expanded and reconstructed buildings as well as energy-saving renovation of existing buildings. Feasibility study reports, construction plans and preliminary design documents of construction projects shall include analysis reports on building energy consumption, renewable energy utilization and building carbon emissions. The construction drawing design documents should specify the technical requirements for building energy-saving measures and the operation and management of renewable energy utilization systems.

2.0.6

Different types of buildings should meet the corresponding performance requirements according to the building classification. Building classification and parameter calculation shall comply with the provisions of Appendix B of this code.

2.0.7

When the engineering design is changed, the energy-saving performance of the building shall not be reduced.

2.0.8

The pipes of the cooling system and the heating system of the non-heating room shall be designed for thermal insulation.

3.1 Building and Envelope

3.1.1

The thermal design of buildings and enclosure structures shall meet the performance requirements of this section; among them, Articles 3.1.2, 3.1.4, 3.1.6~3.1.10 and 3.1.12 of this code shall It is allowed to meet the requirements by weighing the thermal performance of the enclosure structure according to the provisions of Appendix C of this code.

3.1.2

The shape coefficient of residential buildings shall meet the requirements in Table 3.1.2.

3.1.3

The shape coefficient of public buildings in severe cold and cold regions shall meet the requirements in Table 3.1.3.

3.1.4

The window-to-wall area ratio of residential buildings shall comply with the requirements in Table 3.1.4; among them, each residence shall allow a room with a window-to-wall area ratio not greater than 0.6 in one orientation.

3.1.5

The ratio of the roof skylight of the residential building to the roof area of the room where it is located shall meet the requirements in Table 3.1.5.

3.1.6

The area of the transparent part of the roof of Category A public buildings should not exceed 20% of the total roof area.

3.1.7

The total window-to-wall area ratio of industrial buildings with heating and air-conditioning systems should not be greater than 0.50, and the area of the roof's light-transmitting part should not be greater than 15% of the total roof area.

3.1.8

The thermal performance index of the non-light-transmitting enclosure structure of residential buildings shall comply with the provisions in Table 3.1.8-1~Table 3.1.8-11.

3.1.9

The thermal performance index of the light-transmitting enclosure structure of residential buildings shall comply with the provisions in Table 3.1.9-1~Table 3.1.9-5.

3.1.10

The thermal performance of the enclosure structure of Category A public buildings shall comply with the provisions in Table 3.1.10-1~Table 3.1.10-6.

3.1.11

The thermal performance of the enclosure structure of Category B public buildings shall comply with the provisions in Table 3.1.11-1 and Table 3.1.11-2.

3.1.12

The thermal performance of the envelope structure of industrial buildings with heating and air-conditioning systems shall comply with the provisions in Table 3.1.12-1~Table 3.1.12-9.

3.1.13

When a full glass curtain wall is used in the entrance lobby of a public building, the area of non-hollow glass in the full glass curtain wall shall not exceed 15% of the light transmission area (doors, windows and glass curtain walls) of the same facade of the building, and shall be The average heat transfer coefficient is calculated by weighting the light transmission area (including the area of the full glass curtain wall).

3.1.14

The ventilation opening area of the external window shall meet the following requirements.

1 The ventilation opening area of the external windows of the residential buildings in Zone