



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

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**Unified standard for energy efficiency design of industrial
buildings**

工业建筑节能设计统一标准

(English Translation)

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Foreword

This standard was jointly compiled by Central Research Institute of Building and Construction Co., Ltd., MCC Group and Xi'an University of Architecture and Technology together with the organizations concerned in accordance with the requirements of the "Notice on Printing and Distributing the Plan for the Formulation and Revision of Engineering Construction Standards and Codes in 2007" (JIANBIAO [2007] No. 126) issued by the Ministry of Housing and Urban-Rural Development.

During the compilation of this standard, the drafting group carried out extensive investigation and research, conscientiously summarized engineering practice experience, referred to relevant domestic and foreign technical standards and, on the basis of widely soliciting opinions, finally finalized the standard through review.

This standard consists of 8 chapters and 3 appendices. The main technical contents include: general provisions; terms; basic requirements; building and building thermal engineering; heating, ventilation, air conditioning, water supply and drainage; electrical; energy recovery and renewable energy utilization; monitoring and control, etc.

The provisions printed in bold type in this standard are compulsory provisions and shall be strictly implemented.

The Ministry of Housing and Urban-Rural Development is in charge of the administration of this standard and the explanation of the compulsory provisions, the China Metallurgical Construction Association is responsible for its specific management, and Central Research Institute of Building and Construction Co., Ltd., MCC Group is responsible for the explanation of specific technical contents. If there are any opinions or suggestions during the implementation of this standard, please send them to Central Research Institute of Building and Construction Co., Ltd., MCC Group (address: No. 33 Xitucheng Road, Haidian District, Beijing; postcode: 100088).

Chief development organizations and participating development organizations of this standard:

Chief development organizations: Central Research Institute of Building and Construction Co., Ltd., MCC Group; Xi'an University of Architecture and Technology.

Participating development organizations: Tsinghua University; China ENFI Engineering Co., Ltd.; Machinery Industry No. 6 Design and Research Institute Co., Ltd.; China Academy of Building Research; China National Engineering Research Center for Steel Construction; China Wuzhou Engineering Design Group Co., Ltd.; Liaoning Provincial Architectural Design and Research Institute; Shenyang Jianzhu University; Shandong Qiweite Artificial Environment Co., Ltd.; Anhui Hengrui New Energy Co., Ltd.

1 General provisions

1.0.1

This standard is formulated with a view to regulating the energy efficiency design of industrial buildings, unifying energy efficiency design standards, achieving the saving and rational use of energy resources and improving the utilization efficiency of energy resources.

1.0.2

This standard is applicable to the energy efficiency design of newly built, reconstructed and expanded industrial buildings. The energy efficiency design of plant buildings or parts thereof in special industries or with special requirements shall be carried out in accordance with their dedicated energy efficiency design standards.

1.0.3

This standard sets forth general energy efficiency design requirements for the disciplines of building and building thermal engineering, heating, ventilation, air conditioning, water supply and drainage, electrical, energy recovery and renewable energy utilization, etc. in industrial buildings, specifies the corresponding energy saving measures and guides the energy efficiency design of industrial buildings.

1.0.4

The energy efficiency design of industrial buildings shall comply not only with this standard but also with the current relevant standards of the nation.

2.0.1 industrial building

Building consisting of production buildings and production auxiliary buildings, the production auxiliary buildings including warehouses, public auxiliary buildings, etc.

2.0.2 energy consumption of industrial building

The total amount of all kinds of energy consumed by an industrial building during use. It includes the various energy consumptions arising to ensure the indoor environment required for production and personnel in the industrial building and to meet the standards for emission to the outdoor atmosphere, and also includes the various energy

consumptions arising from the building water supply system and its water treatment, etc.

2.0.3 industrial building energy efficiency

The process of achieving zero energy consumption, or reducing operating energy consumption and improving energy utilization efficiency, by taking technical measures and management means during the planning, design and use of industrial buildings, on the premise of satisfying the specified building function requirements and indoor and outdoor environmental quality.

2.0.4 intensity of waste heat

The heat generated by indoor personnel, lighting and production processes and dissipated into the indoor space environment, calculated as heat per unit building volume (W/m³).

2.0.5 total window to wall ratio

The ratio of the sum of the total opening areas of the light-transmitting parts and of the non-light-transmitting external doors and windows on all elevations of a building to the sum of the total areas of all elevations.

2.0.6 building envelope thermal performance trade-off

The calculation carried out, when the design of an industrial building cannot fully satisfy the specified thermal design requirements or calculation conditions of the building envelope, to determine whether the overall thermal performance of the building envelope complies with the energy efficiency design or indoor environment requirements.

2.0.7 reference building

The baseline building used for calculating the annual heating and air-conditioning energy consumption that satisfies the requirements of the standard when the building envelope thermal performance trade-off of a Class I industrial building is carried out.

2.0.8 system coefficient of refrigeration performance (SCOP)

Under nominal operating conditions, the ratio of the rated cooling capacity of an electrically powered air-conditioning cooling source system (including the refrigerating machines, cooling water pumps and cooling towers, or the fans of air-cooled units) to its net input energy.

3.1 Classification and basic principles of energy efficiency design