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GB 50016-2014

**Code for Fire Protection Design of
Buildings**

建筑设计防火规范

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中华人民共和国国家标准

Code for Fire Protection Design of Buildings

建筑设计防火规范

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Authorized by the Research Institute of Standards and Norms (RISN) of the Ministry of Housing and Urban-Rural Development, this code is published and distributed by China Planning Press.

Ministry of Housing and Urban-Rural Development of the People's Republic of China
August 27, 2014

Foreword

According to the requirements of Document JianBiao [2007] No.125 - "Notice on Printing the Development and Revision Plan of National Engineering Construction Standards and Codes (the First Batch) in 2007" and Document JianBiao [2009] No.94 - "Letter on the Correction of Revision Plan for 'Code of Design on Building Fire Protection and Prevention' and 'Code for Fire Protection Design of Tall Building'", issued by the Ministry of Housing and Urban-Rural Development, this code was formulated by Tianjin Fire Control Institute and Sichuan Fire Research Institute of Ministry of Public Security jointly with other organizations concerned through integrating and revising on the basis of "Code of Design on Building Fire Protection and Prevention" (GB 50016-2006) and "Code for Fire Protection Design of Tall Building" (GB 50045-95).

During the process of revising this code, the revision group followed the relevant national principles and policies in capital construction, implemented the fire policy of "prevention first and combining prevention with fire-fighting", learned the lessons from major fire accidents in China in recent years, earnestly summarized practical experience in fire protection design of buildings and scientific and technical achievements in fire-fighting at home and abroad, made deep researches on the new conditions and problems in engineering construction and the difficult problems in the code implementation, seriously studied and absorbed experience from developed countries, carried out a lot of subject studies, technical discussions and necessary tests, solicited wide opinions from design, production, construction, scientific research, education and fire supervision organizations, etc. and finalized this code through review.

This code comprises twelve chapters and three appendixes, covering: requirements for fire hazard classification of production and storage and classification of high-rise buildings, basic requirements for fire resistance class of industrial and civil buildings such as factory buildings, storages, residential buildings and public buildings and basic requirements for fire resistance rating, plane arrangement, fire compartment, fire separation, building fire protection construction, fire separation distance and fire-fighting facilities arrangement of the building elements, basic measures and requirements for explosion protection of industrial buildings; basic requirements for evacuation distance, evacuation width, evacuation stairs layout type, emergency lighting and evacuation indicating signs, and safety exit and evacuation door layout of industrial and civil buildings; basic requirements for the fire separation distance, grouped layout and storage volume of Class A, B, C liquid and gas tanks (tank farm) and stackyard for combustibles; basic requirements for fire protection design of timber building and city road tunnel engineering; basic requirements of field for fire fighting, fire lane, fire elevator and other facilities set to meet the fire fighting and rescue requirements; fire protection requirements in such aspects as heating, ventilating and air conditioning and electricity of buildings as well as basic requirements for power supply, distribution line and the like of fire-fighting electric equipment.

There have been some significant changes in this code over "Code of Design on Building Fire Protection and Prevention" (GB 50016-2006) and "Code for Fire Protection Design of Tall Building" (GB 50045-95) (2005 edition) as follows:

1. "Code of Design on Building Fire Protection and Prevention" and "Code for Fire Protection Design of Tall Building" were incorporated, with their inconsistent requirements adjusted. The residential buildings were classified uniformly by their building height.

2. Two chapters ("Fire Fighting and Rescue Facilities" and "Timber Buildings") were added, improving the relevant requirements of fire-fighting and rescue and standardizing the fire protection requirements of timber buildings.

3. The fire protection requirements of thermal insulation system for buildings were supplemented.

4. Specific requirements were made for the arrangement of fire-fighting facilities and the relevant contents were perfected; the requirements for the design of fire water supply system, indoor and outdoor fire hydrant systems and smoke control and smoke exhaust system were specified in corresponding national standards respectively.

5. The fire protection requirements of high-rise residential buildings and the high-rise civil buildings with building height larger than 100m were properly improved.

6. The fire protection requirements of roofed commercial pedestrian street when it is used for the safe evacuation of the buildings on both sides of it were supplemented; the design evacuation people density of business hall and exhibition hall of building materials, furniture and light fixture stores were adjusted and supplemented.

7. The fire protection requirements for underground storages, logistics buildings, large combustible gas tanks (tank farm), liquid ammonia tanks and LNG tanks were supplemented, and the fire separation distance of liquid oxygen tanks and the like were adjusted.

8. The relevant requirements for preventing vertical or horizontal fire spread in buildings were improved.

Provisions printed in bold type in this code are mandatory ones and must be implemented strictly.

The Ministry of Housing and Urban-Rural Development of the People's Republic of China is in charge of the administration of this code and the explanation of compulsory provisions; the Ministry of Public Security of the People's Republic of China is responsible for the routine management; authorized by Fire Department of MPS, Tianjin Fire Research Institute and Sichuan Fire Research Institute are responsible for the explanation of specific technical contents.

Whereas this code is a comprehensive fire protection technical standard with strong policy and technology orientations and wide coverage, all relevant organizations are kindly requested to sum up and accumulate your experience in engineering practice and scientific research during the process of implementing this code, and relevant comments, recommendations and problems, whenever necessary, can be posted or passed on to the Fire Department of MPS (address: No.70 Guang'anmen South Street, Xicheng District, Beijing, 100054, China) for reference in the future revision and for interpretation by Tianjin and Sichuan Fire Research Institutes of MPS.

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1 General Provisions

1.0.1 This code is formulated with a view to preventing fire accidents in buildings, reducing fire hazards and protecting personal and property safety.

1.0.2 This code is applicable to the following constructed, renovated and extended buildings:

- 1 Factory buildings;
- 2 Storages;
- 3 Civil buildings;
- 4 Class A, B, C liquid tanks (tank farm);
- 5 Combustible and combustion-supporting gas tanks (tank farm);
- 6 Stackyard for combustibles;
- 7 City road tunnels.

If special national standards are available, the fire protection design of buildings for civil air defense engineering, petroleum and natural gas engineering, petrochemical engineering, thermal power plants and substations should comply with such standards.

1.0.3 This code is not applicable to the fire protection design of buildings such as factory buildings (storages) for gunpowder, explosive and their products as well as fireworks and firecrackers.

1.0.4 Where occupancies for different purposes are arranged in the same building, fire separation shall be provided between them. The fire protection design for this building and their functional occupancies shall be determined according to the relevant requirements of this code.

1.0.5 The fire protection design of buildings shall comply with the relevant national principles and policies, and guarantee, on the whole, safety and usability, advanced technology as well as economy and rationality according to the characteristics of buildings and fire hazards in them.

1.0.6 In addition to meeting the requirements of this code, the buildings with height larger than 250m shall also be taken with stricter fire prevention measures according to the actual conditions. Their fire protection design shall be submitted to the national fire authorities for subject study and demonstration.

1.0.7 In addition to the requirements of this code, the fire protection design of buildings shall also comply with those specified in the current relevant standards of the nation.

2 Terminologies and Symbols

2.1 Terminologies

2.1.1 High-rise building

The residential buildings with height larger than 27m and the non-single-storey factory buildings, storages and other civil buildings with height larger than 24m.

Note: The calculation of building height shall meet those specified in Appendix A of this code.

2.1.2 Podium

The ancillary building with height not larger than 24m, which is beyond the projection of the main body of high-rise building but is connected with the main body.

2.1.3 Important public building

The public building which may cause heavy casualties, property loss and severe social impact in case of fire.

2.1.4 Commercial facilities

Small business houses such as stores, post offices, savings banks, barbershops located on the first floor or on the first floor and second floor of residential buildings, with the building area of each separated unit not larger than 300m².

2.1.5 High rack storage

Mechanical or automatic rack storage, with rack height larger than 7m.

2.1.6 Semi-basement

A floor of a building, with the average height of the room ground below the outdoor design ground for 1/3~1/2 of the average clear height of such room.

2.1.7 Basement

A floor of a building, with the average height of the room ground below the outdoor design ground greater than 1/2 of the average clear height of such room.

2.1.8 Open flame location

A fixed location, indoor or outdoor, with exposed flame or red hot surface, excluding cooking appliance, induction cooker and the like in a civil building.

2.1.9 Sparking site

A fixed location like chimney with spotting fire, or for such operations as outdoor grinding wheel, electric welding, gas welding and gas cutting.

2.1.10 Fire resistance rating

A period starting from the time that the elements, accessories or structures of a building are exposed to fire, under standard fire resistance conditions, to the time that they lose bearing capacity, integrity or insulation, expressed in hours.

2.1.11 Fire partition wall

Non-combustible wall in a building, with fire resistance rating not inferior to relevant requirements, for preventing fire from spreading to adjacent areas.

2.1.12 Fire wall

Non-combustible wall in a building, with fire resistance rating not less than 3.00h, for preventing fire from spreading to adjacent buildings or adjacent horizontal fire compartments.

2.1.13 Refuge floor (room)

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