



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

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**Code for design of sprinkler systems
(English Translation)**

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1 General provisions

1.0.1 This code is developed to properly and reasonably design sprinkler

1.0.1 This code is developed to properly and reasonably design sprinkler

systems and to protect the safety of the person and property.

1.0.2 This code applies to the design of sprinkler systems in newly built, expanded or rebuilt civil and industrial buildings.

This code does not apply to the design of sprinkler systems in buildings of special functions such as gunpowder, explosives, ammunition, pyrotechnics factories, nuclear power plants and hangars.

1.0.3 The design of the sprinkler system shall closely integrate the functions of protection objects and fire characteristics, and actively adopt new technologies, new equipment, and

new materials, so that they are safe, reliable, technologically advanced, and economically reasonable.

1.0.4 The system components used in the design must comply with the current relevant national standards and shall meet the requirements of the market access system for firefighting products.

1.0.5 When the buildings or the areas in the buildings which are set sprinkler

system change their applications, it shall check the suitability of the original system. When it is not applicable, it shall be redesigned in accordance with this code.

1.0.6 The design of sprinkler systems shall comply with the provisions of the relevant current national standards in addition to the provisions of this code.

2.1.1 Sprinkler system

The automatic fire extinguishing system that can spray water in the event of a fire, which consists of sprinkler, alarm valve sets, waterflow alarm devices (waterflow indicators or pressure switches), as well as pipelines, water supply facilities, etc.

2.1.2 Close-type sprinkler system

The sprinkler system which uses the close-type sprinklers.

2.1.3 Open-type sprinkler system

The sprinkler system which uses the open-type sprinklers.

2.1.7 Recycling preaction sprinkler system

The preaction sprinkler system that can close the valve automatically after putting out fire and open the valve again to spray water in case of re-ignition.

2.1.8 Deluge sprinkler system

An open-type system which consists of an open-type sprinkler and a deluge alarm valve set, is controlled by the automatic fire alarm system or transmission pipe in case of a fire, to automatically start the deluge alarm valve set and to start the fire water pump, for the purposes of putting out fire.

2.1.12 Cooling protection sprinkler system

A close-type system which consists of a close-type sprinkler, a wet pipe alarm valve set, etc., used to cool fireproof shutter, fireproof glass walls and other fireproof partitions in the event of a fire.

2.1.13 Operation area of sprinkler system

The maximum area protected by the system based on spray intensity in a fire.

2.1.14 Response time index (RTI)

Thermal performance indicators for close-type sprinklers.

2.1.15 Fast response sprinkler

The close-type sprinkler which has a response time index $RTI \leq 50 \text{ (m} \cdot \text{s)}^{0.5}$.

2.1.16 Special response sprinkler

The close-type sprinkler which has a response time index $50 < RTI \leq 80 \text{ (m} \cdot \text{s)}^{0.5}$.

2.1.21 Standard orifice sprinkler

Standard coverage sprinkler which has a flow coefficient $K = 80$.

2.1.22 Early suppression fast response (ESFR) sprinkler

The standard coverage sprinkler which has a flow coefficient $K \geq 161$ and a response time index $RTI \leq 28 \pm 8 \text{ (m} \cdot \text{s)}^{0.5}$, used to protect the stacks and high rack warehouses.

3 Hazard classifications of occupancies

3.0.1

The fire hazard of occupancies is divided into light hazard level, medium hazard level (level I and level II), serious hazard level (level I and level II), and warehouse hazard level (level I, II and III).

3.0.3

When there is a significant difference between the fire risk and the difficulty of fire extinguishing in each place of the building, it should determine the system type selection and fire hazard level in accordance with the actual situation of each place.

4.3 Others

4.3.1

The dry pipe sprinkler system, pre-action sprinkler system, deluge sprinkler system, and sprinkler-foam combination system in the building to protect local places can be connected in series to the wet pipe sprinkler system in the same building, and it shall be connected to the feed mains.

4.3.2

The sprinkler system shall have the following components, accessories and facilities.

5 Basic design parameters

5.0.1

The basic design parameters for the use of wet pipe sprinkler systems in civil buildings and workshops shall not be less than those specified in Table 5.0.1.

5.0.7

For the warehouses and similar places which are equipped with the sprinkler systems, when using the shelf storage, it shall use the steel shelf and the transparent level plate, and the transparent part area in the layer plate shall not be less than 50% of the total area of the level plate. When using wooden shelf or enclosed level plate shelf, the system setting shall be determined by stacking storage warehouse.

5.0.16 Except as otherwise provided in this code, the continuous water spray

time of a sprinkler system shall be determined in accordance with the requirements that the fire duration is not less than 1 h.

5.0.17 For the dry pipe sprinkler system and pre-action sprinkler system using pressurized gas as the starting medium, the pressure value in the system pipes shall be determined in accordance with the technical performance of the alarm valve; for the pre-action sprinkler system using pressurized gas to check whether the pipeline is tight, the pressure value in the system pipes should neither be less than 0.03 MPa nor more than 0.05 MPa.

6.1.1 Where a close-type sprinkler system is to be installed, the sprinkler type

and the maximum headroom height of the place shall comply with the requirements of Table 6.1.1; the sprinklers used only to protect building components such as interior steel trusses and the places wherein the shelf built-in sprinklers are provided may not be limited by the requirements of this Table.

6.1.4 Dry pipe sprinkler systems and pre-action sprinkler systems shall use the vertical sprinklers or dry type pendent sprinklers.

6.1.5 The sprinkler selection of the drencher sprinkler system shall meet the following requirements.

6.2 Alarm valve set

6.2.1

The sprinkler system shall be equipped with an alarm valve set. The close-type sprinkler