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Hygienic specification for facilities of secondary water supply

二次供水设施卫生规范

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Basic hygienic requirements
- 5 Hygienic requirements for machine rooms
- 6 Hygienic requirements for water tanks (pools)
- 7 Hygienic requirements for disinfection equipment
- 8 Operational requirements
 - 8.1 Requirements for operating unit and personnel

1 Scope

China's mandatory hygienic specification for secondary water supply facilities. Secondary supply is what lifts mains water into the tanks and pumps of a tall building, and it is the point where drinking water most often becomes unsafe in a modern city - not in the treatment works or the mains, but in the roof tank of a residential block. The reasons are consistent: the residual chlorine that protected the water in the main is gone by the time it has stood in a tank, the tank is warm and open to insects and birds, and it is cleaned once in years or never. The specification covers the materials in contact with the water, the tank's construction, cover and overflow arrangements that keep contamination out, the residence time and the sizing that prevents stagnation, the disinfection and the cleaning frequency, and the water quality that must be delivered at the tap.

This document specifies the basic hygienic requirements for secondary water supply facilities, including hygienic requirements for machine rooms, hygienic requirements for water tanks (pools), hygienic requirements for disinfection equipment, and operational requirements. This document applies to secondary drinking water supply facilities.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 5749-2022 Standards for drinking water quality

GB/T 5750 (all parts) Standard examination methods for drinking water

GB/T 17219 Standard for safety evaluation of equipment and protective materials in drinking water system

GB 28232 Hygienic requirements for ozone disinfectant

GB 28233 Hygienic requirements for sodium hypochlorite generator

GB 28235-2020 Hygienic requirements for ultraviolet appliance of disinfection

GB 28931 Hygienic requirements for chlorine dioxide disinfectant generator

GB/T 32091-2015 Ultraviolet equipment for water disinfection - Ultraviolet dose testing method

GB 50015 Standard for design of building water supply and drainage

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1 secondary water supply A water supply method in which centralized water supply is re-stored, pressurized, and disinfected before being delivered to households via pipelines.

3.2 secondary water supply facilities Equipment and pipelines for storage, pressurization, disinfection, transportation, etc. of centralized water supply before being delivered to households.

3.3 water tank (pool) A tank or pool for storing drinking water. NOTE. Depending on location, it is classified as low-level water tanks (pools), mid-level water tanks, and high-level water tanks.

4 Basic hygienic requirements

4.1 Secondary water supply facilities shall be located independently within a locked machine room.

4.2 Water supply pipelines for secondary water supply shall not be directly connected to non-potable water pipelines and equipment.

4.3 The layout and laying of water supply pipelines shall comply with the provisions of GB 50015.

4.4 Water distribution equipment and protective materials shall comply with the provisions of GB/T 17219.

4.5 Disinfectants and disinfection equipment shall comply with the provisions of "Standard for hygienic safety evaluation of disinfectants and disinfection facilities for drinking water (trial)."

4.6 Water sampling ports shall be installed on the water inlet and outlet pipes of secondary

water supply facilities.

5 Hygienic requirements for machine rooms

5.1 The doors and windows of machine rooms shall be locked; the windows shall be equipped with protective grilles; access control and video surveillance systems are recommended.

5.2 Machine rooms shall be equipped with rat screens and pest control devices.

5.3 The top surface of the equipment foundation in machine rooms shall be at least 0.1 m above the floor.

6 Hygienic requirements for water tanks (pools)

6.1 The distance between water tanks (pools) and pollution sources and pollutants shall comply with the provisions of GB 50015, and the surrounding environment shall be kept clean and tidy.

6.2 Water tanks (pools) shall be dedicated and shall not be connected to non-potable water tanks (pools).

6.3 The designed capacity of water tanks (pools) shall not exceed the user's 48-hour water consumption.

6.4 Water tanks shall be installed on a foundation with drainage facilities. Water tanks (pools) shall be equipped with at least 2 vent pipes and vent covers, preferably installed diagonally, and shall also be equipped with corrosion-resistant filters and insect-proof nets.

6.5 Water tanks (pools) shall have manholes. Manholes shall be located at the top of the water tank and at least

0.05 m above the top. The location and size of manholes shall meet the requirements for cleaning and disinfection of water tanks (pools). Manholes shall be equipped with covers (or doors) and locks, two-person-two-lock management shall be implemented, and opening records shall be kept.

6.6 The distance between the top of a water tank installed in a building and the roof shall be at least

0.8 m; the distance between the outer wall of the water tank and the wall, and the distance between the bottom of the water tank and the floor of the room shall comply with the provisions of GB 50015. Ladders shall be provided inside and outside water tanks (pools).

6.7 The surfaces of water tanks (pools) that come into contact with drinking water shall be visually appealing, smooth, and leak-proof.

6.8 Water tanks (pools) shall be equipped with water inlet and outlet pipes. The water inlet pipe shall be located at the top of the water tank (pool); the air gap between its lowest point and the overflow edge shall be at least the same as the diameter of the water inlet pipe and shall be at least 25 mm, but may be no greater than 150 mm. The water outlet pipe shall be located at the bottom of the water tank (pool). The water inlet and outlet pipes shall be installed on opposite sides of the water tank.

7 Hygienic requirements for disinfection equipment

7.1 Secondary water supply facilities should have a location for disinfection equipment. Secondary water supply facilities, except for non-negative pressure water supply equipment and water tanks (pools) with free chlorine in the inlet water greater than

0.4 mg/L, shall be equipped with disinfection equipment.

7.2 Ultraviolet disinfectors shall comply with the provisions of

4.2 of GB 28235-2020 and be equipped with a mechanical cleaning device; the scaling coefficient of the quartz sleeve shall not be less than 0.6, and the ultraviolet intensity shall be greater than $70 \mu\text{W}/\text{cm}^2$. At peak flow rate and at the end of the ultraviolet lamp's operating life, the effective ultraviolet dose shall not be less than $40 \text{ mJ}/\text{cm}^2$. The scaling coefficient test method shall be in accordance with Annex B of GB/T 32091-2015, the ultraviolet intensity test method shall be in accordance with Annex A of GB 28235-2020, and the ultraviolet dose test method shall be in accordance with Annex E of GB/T 32091-2015.

7.3 Chlorine dioxide disinfectant generators shall comply with the provisions of GB 28931.

7.4 Sodium hypochlorite generators shall comply with the provisions of GB 28233.

7.5 Ozone disinfectors shall comply with the provisions of GB 28232.

8.1 Requirements for operating unit and personnel

8.1.1 The operating unit is responsible for the daily management of secondary water supply facilities, including inspection, operation, maintenance, cleaning, and disinfection.

8.1.2 The operating unit shall establish and implement systems for the management, maintenance, water tank (pool) cleaning, disinfection, and water quality testing of secondary water supply facilities, as well as emergency response plans for water pollution incidents.

8.1.3 The operating unit shall appoint full-time (or part-time) water management personnel with clearly defined job responsibilities.