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**Technical Requirement for Ozone Treatment
Recirculating Cooling Water for Central Air
Conditioning**

臭氧处理中央空调循环冷却水技术要求

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Table of Contents

Foreword.....	3
1 Scope.....	4
2 Normative References	4
3 Terms and Definitions	5
4 General Requirements.....	7
5 Requirements.....	7
6 Test Methods.....	9

Technical Requirement for Ozone Treatment Recirculating Cooling Water for Central Air Conditioning

1 Scope

This Standard specifies the general requirements, requirements and test methods of ozone treatment recirculating cooling water for central air conditioning.

This Standard is applicable to open-type recirculating cooling water system for central air conditioning that adopts ozone treatment technology in civil buildings. This Standard does not apply to closed-type recirculating cooling water system.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB 3095 Ambient Air Quality Standard

GB 5749 Standards for Drinking Water Quality

GB/T 5750.11 Standard Examination Methods for Drinking Water - Disinfectants Parameter

GB/T 6908 Analysis of Water Used in Boiler and Cooling System - Determination of Electrical Conductivity

GB/T 6920 Water Quality - Determination of pH Value - Glass Electrode Method

GB/T 11893 Water Quality - Determination of Total Phosphorus - Ammonium Molybdate Spectrophotometric Method

GB/T 14643.1 Examination of Bacteria and Algae in Industrial Circulating Cooling Water - Part 1: Examination of Bacteria Formed Deposits - Standard of Plate Count

GB/T 15451 Industrial Circulating Cooling Water - Determination of Total and Composite Alkalinity

GB/T 15893.1 Industrial Circulating Cooling Water - Determination of Turbidity -

transfer heat, and the recirculating cooling water directly contacts the atmosphere to dissipate heat.

3.2 Ozone Treatment Recirculating Cooling Water System for Central Air Conditioning

Ozone treatment recirculating cooling water system for central air conditioning refers to a system that uses ozone as a water treatment agent to bypass or directly dissolve ozone into the recirculating cooling water of the central air conditioning for the treatment of the recirculating cooling water.

NOTE: hereinafter referred to as recirculating cooling water system.

3.3 Nontraditional Water Source

Nontraditional water source refers to a water source different from the traditional surface water supply and groundwater supply. It includes reclaimed water, rainwater and sea water, etc.

3.4 Slime

Slime refers to a muddy substance, in which, microorganisms and their secreted mucus are mixed with other organic and inorganic impurities.

3.5 Slime Content

Slime content refers to the volume of slime contained in the recirculating cooling water measured through the biological filter method.

NOTE: it is expressed in (mL/m³).

3.6 Cycle of Concentration

Cycle of concentration refers to the ratio of the salt concentration of the recirculating cooling water to the supplementary water.

3.7 Corrosion Rate

Corrosion rate refers to the annual average corrosion depth calculated by metal corrosion weight loss.

NOTE: it is expressed in (mm/a).

3.8 Fouling Resistance

Fouling resistance refers to the value of the degree of decrease in the heat transfer efficiency due to deposits on the heat transfer surface of the heat exchange equipment.

NOTE: it is expressed in (m² • K/W).

4 General Requirements

4.1 The design and safety measures of the recirculating cooling water system shall comply with the stipulations of GB/T 32107.

4.2 The supplementary water of the recirculating cooling water system should comply with the urban water supply requirements specified in GB 5749. Nontraditional water source may be used, and the water quality shall comply with the water quality requirements of supplementary water of indirect open recirculating cooling water system of central air conditioning in GB/T 29044-2012. The total phosphorus and the total number of bacteria shall comply with the water quality requirements of supplementary water of indirect open recirculating cooling water system used for reclaimed water in GB/T 50050-2017.

4.3 The water drainage quality of the recirculating cooling water system shall comply with the stipulations of GB/T 31962.

5 Requirements

5.1 Ozone Concentration

5.1.1 The ozone concentration in the recirculating cooling water of the recirculating cooling water system before entering the heat exchanger shall be 0.01 mg/L ~ 0.1 mg/L.

5.1.2 The ozone concentration in the air of the ozone generator room shall not be greater than 0.30 mg/m³ and shall comply with the stipulations of GBZ 2.1.

5.1.3 The ozone concentration in the air around the cooling tower shall not be greater than 0.20 mg/m³ and shall comply with the stipulations of GB 3095.

5.2 Cycle of Concentration

5.2.1 The cycle of concentration of the recirculating cooling water system shall be calculated in accordance with Formula (1):

$$N = \frac{\rho_r}{\rho_m} \dots\dots\dots (1)$$

Where,

N ---the cycle of concentration;

ρ ---the conductivity in the recirculating cooling water or the concentration of relatively stable water quality indicators, such as: potassium, sodium and chlorine, etc.,

6 Test Methods

6.1 Ozone Concentration

6.1.1 Ozone concentration in the recirculating cooling water shall be determined through the indigo on-site determination method and tested in accordance with the stipulations of GB/T 5750.11.

6.1.2 Ozone concentration in the air of the ozone generator room shall be tested in accordance with the stipulations of GBZ/T 300.48.

6.1.3 Ozone concentration in the air around the cooling tower shall be tested in accordance with the stipulations of HJ 504.

6.2 Cycle of Concentration

Conductivity shall be tested in accordance with the stipulations of GB/T 6908. Potassium and sodium shall be tested in accordance with the stipulations of HJ 776. Chlorine shall be tested in accordance with the stipulations of HJ 84.

6.3 Medium of Recirculating Cooling Water

6.3.1 Turbidity shall be tested in accordance with the stipulations of GB/T 15893.1.

6.3.2 pH value shall be tested in accordance with the stipulations of GB/T 6920.

6.3.3 Chemical oxygen demand (COD_{Cr}) shall be tested in accordance with the stipulations of HJ 828.

6.3.4 Ammonia nitrogen shall be tested in accordance with the stipulations of HJ 535.

6.3.5 Total phosphorus shall be tested in accordance with the stipulations of GB/T 11893.

6.3.6 Total iron shall be tested in accordance with the stipulations of HJ 776.

6.3.7 Copper shall be tested in accordance with the stipulations of HJ 776.

6.3.8 Calcium hardness shall be tested in accordance with the stipulations of HJ 776. Total alkalinity shall be tested in accordance with the stipulations of GB/T 15451.

6.3.9 $[\text{SO}_4^{2-}]$ and $[\text{Cl}^-]$ shall be tested in accordance with the stipulations of HJ 84.

6.3.10 Total number of heterotrophic bacteria shall be tested in accordance with the stipulations of HG/T 4207.

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