

CCS P 73



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

GB 51414-2020

**Standard for water saving design in non-ferrous metals
enterprises**

Issued on: January 16, 2020

Implemented on: August 1, 2020

**Issued by: Ministry of Housing and Urban-Rural Development of the
People's Republic of China;
State Administration for Market Regulation**

Table of Contents

- 1 General
- 2 Terminology and symbols
- 2.1 Terminology
- 3 basic rules
- 4 Water requirements for production process
- 4.1 General provisions
- 4.2 Mining
- 4.3 Mineral dressing
- 4.4 Tailings
- 4.5 Heavy non-ferrous metal smelting
- 4.6 Light metal smelting
- 4.7 Rare metal smelting
- 4.8 Non-ferrous metal processing
- 4.9 Silicon material preparation

1 General

1.0.1 This standard is formulated for rational use of water resources, improvement of water efficiency, water conservation, development and utilization of unconventional water sources, and construction of water-saving non-ferrous metal enterprises.

1.0.2 This standard applies to the planning, feasibility study, preliminary design, construction drawing design and other stages of new construction, expansion and reconstruction projects of non-ferrous metal enterprises.

1.0.3 The water-saving design of non-ferrous metal enterprises should conform to the development planning of local urban, industrial and agricultural water use, and rationally use water resources.

1.0.4 Water-saving measures should be included in the design of non-ferrous metal engineering projects.

1.0.5 The water-saving design of non-ferrous metal enterprises should use advanced technology, advanced equipment and advanced materials.

1.0.6 The water-saving design of non-ferrous metal enterprises shall not only comply with this standard, but also comply with the current relevant national standards.

2.1.1 process water process water

Water used in the production process of the non-ferrous metal industry, including process water, washing water, cooling water and other water.

2.1.2 Reclaimed water

Industrial wastewater or domestic sewage can meet the graded use or meet the relevant water quality standards after treatment, and can be reused.

2.1.3 Backwater mineral processing backwater

The concentrate or tailings are concentrated, filtered and dehydrated water and the backwater of the tailings pond.

2.1.4 main water internal cooling water

Pure water circulating water for cooling rectifier elements or specific equipment.

2.1.5 auxiliary water external cooling water

Circulating water that cools the main water through a heat exchanger.

2.1.6 water saving

The process of adopting non-ferrous metal production processes, technologies and equipment with low water consumption, reducing water consumption, improving water reuse rate, and developing and utilizing unconventional water sources.

2.1.7 Wastewater reuse

Wastewater collection, transportation, treatment and reuse, etc.

2.1.8 Initial rainwater

Initial rainfall runoff after rainfall that carries pollutants and exceeds discharge standards.

2.1.9 noninitial rainwater

Rainwater after initial runoff.

2.1.10 rainwater utilization

Rainwater collection, transportation, treatment and utilization, etc.

2.1.11 Unconventional water resources

Urban sewage reclaimed water, sea water, mine water, rainwater and other water resources.

2.1.12 Biologics

Sewage treatment agents synthesized by using active ingredients in microorganisms or their metabolites.

2.1.13 Mechanical vapor recompression technology mechanical vapor recompression (MVR)

Using the secondary steam and its energy generated by the evaporation system itself, the low-grade steam is upgraded to a high-grade steam heat source through the mechanical work of the compressor, and the energy-saving technology is used to provide heat energy to the Yanfa system and reduce the demand for external energy.

2.1.14 Multiple-effect evaporation technology (MEE)

Multiple evaporators are connected end to end and operated in series. The secondary steam generated by the previous effect evaporator is used as the heating steam for the next effect rattan hair dryer, and the heat energy is reused many times to reduce heat energy consumption. Energy-saving technology.

2.1.15 thermal vapor recompression technology thermal vapor recompressor (TVR)

According to the heat pump principle, part of the high-grade heat energy is consumed when the thermal steam is recompressed, and the low-grade secondary steam of the evaporator is transferred to the high-grade fresh steam, so that the high-grade secondary steam replaces the fresh steam to reheat the heat energy utilization technology of the evaporator.

2.1.16 dry dust collection (dry dust collection) dry dust collection

Processes that do not use liquids to capture dust.

2.1.17 Indirect cooling indirect cooling

The cooling water is in indirect contact with the cooled medium or equipment to indirectly reduce the temperature.

2.1.18 direct cooling direct cooling

The cooling water is in direct contact with the cooled medium or equipment to directly cool down.

2.1.19 indirect open recirculating cooling water system

Circulating cooling water system with indirect heat transfer between circulating cooling water and cooled medium, and direct contact between circulating water and atmosphere to dissipate heat.

2.1.20 direct open recirculating cooling water system

The circulating cooling water system is a circulating cooling water system in which the circulating cooling water is in direct contact with the cooled medium to exchange heat, and the circulating water is in direct contact with the atmosphere to dissipate heat.

2.1.21 indirect closed recirculating cooling water system

Circulating cooling water system with indirect heat transfer between circulating cooling water and cooled medium and circulating cooling water not in direct contact with the atmosphere.

2.1.22 reuse water system

Untreated water system used in series in non-ferrous industrial enterprises.

3 basic rules

3.0.1 New construction, expansion and reconstruction of non-ferrous metal industrial enterprises must comply with national, industrial and local pollutant discharge standards.

3.0.2 Water-saving facilities for new construction, expansion and reconstruction of non-ferrous metal projects should be designed, constructed and put into operation at the same time as the main project. When water-saving facilities are constructed in stages, the commissioning time shall not lag behind the staged construction and commissioning time of the main project, and the scale of water-saving facilities shall not be reduced.

3.0.3 New construction, expansion and reconstruction of non-ferrous metal engineering projects should adopt advanced and low water consumption techniques, technologies and equipment. Existing non-ferrous metal enterprises should gradually phase out high water consumption processes, technologies and equipment through technological transformation.

3.0.5 The design of water supply for non-ferrous metal enterprises should be based on water quality requirements.

3.0.6 The drainage design of non-ferrous metal enterprises should be classified according to the drainage water quality, collected, treated by quality, and reused in steps.