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

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**Norm of water intake for industry in the Yellow River basin -
Part 8: Sulfuric acid**

黄河流域工业用水定额 第8部分：硫酸

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Introduction

Under the Yellow River Protection Law of the People's Republic of China, the State operates a system of mandatory water intake norms in the Yellow River basin and lays down mandatory norms for the water-intensive industries and services of that basin. The national standards for those mandatory norms are an important measure of how sparingly the industries concerned use water; they are a means of enforcing the rigid constraint on water resources and the mandatory norm system of the basin, and an important technical basis for the State's water abstraction licensing, for planned water use management, for water resource justification and for water-saving assessment.

GB 45669, Norm of water intake for industry in the Yellow River basin, sets the calculation method, the mandatory norms and the management requirements for the water-intensive industries of the basin according to their several water use characteristics, and is to consist of fourteen parts: thermal power generation, coal preparation, coal-to-olefins, cement, iron and steel, petroleum refining, coal-to-methanol, sulfuric acid, caustic soda, soda ash, synthetic ammonia, urea, alumina and electrolytic aluminium.

This part, Part 8, sets the calculation method, the values of the norm and the management requirements for sulfuric acid in the Yellow River basin.

1 Scope

This document specifies the calculation method, the values and the management requirements of the mandatory water intake norm for sulfuric acid in the Yellow River basin.

It applies to the water management of existing, new, rebuilt and extended industrial sulfuric

acid production enterprises in the Yellow River basin and in the county-level administrative areas of the other Yellow River supply areas of the provinces and autonomous regions through which the Yellow River flows.

2 Normative references

The contents of the following documents constitute indispensable provisions of this document through normative reference in the text. For dated references, only the edition corresponding to that date applies. For undated references, the latest edition, including all amendments, applies.

GB/T 534 Industrial sulfuric acid · GB/T 12452 General principles for water balance test · GB/T 18820 General principles for compiling norm of water intake for industrial enterprise · GB/T 21534 Water saving - Terminology · GB/T 24789 General principles for equipping and managing of water measuring instruments of water using unit · GB/T 28714 Technical guide for water intake measurement

3 Terms and definitions

The terms and definitions given in GB/T 534, GB/T 18820 and GB/T 21534, together with the following, apply to this document.

industrial sulfuric acid production: whole process of producing industrial sulfuric acid from sulfur, pyrite, non-ferrous metal smelting flue gas or gypsum, through the pretreatment of the raw material, the preparation, purification, conversion and absorption of the process gas and the treatment of the waste water and waste gas.

quantity of water intake per unit production of sulfuric acid: quantity of water taken from every source by an industrial sulfuric acid production enterprise per unit of sulfuric acid product, expressed on a 100 % mass fraction basis.

4 Calculation method

Scope of the calculation: the quantity of water counted includes water from conventional sources - surface water, groundwater and the urban supply network - water from unconventional sources such as reclaimed water and harvested rainwater, and other water products bought in, such as softened water, demineralised water and steam.

The water used by an industrial sulfuric acid production enterprise comprises: the water of the main production system, including sulfur melting and heat maintenance, roasting, process gas purification, sulfur trioxide absorption and tail gas treatment; the water of the auxiliary production system, including the boiler, the demineralised water station, the circulating water station, the waste water treatment station, the compressed air station, the machine shop, the testing and analysis laboratory and transport; and the water of the

ancillary production system, including the office building, landscaping, the staff canteen, the staff dormitory, the bathhouse and road watering.

The following are not counted in the norm: water that cannot be recovered because heat is supplied outside the enterprise and the net quantity of steam supplied; water used for waste heat power generation; and water reused after the enterprise's own sewage or waste water has been treated at the waste water treatment plant of the park.

For enterprises making sulfuric acid from non-ferrous metal smelting flue gas, the water used in the roasting of non-ferrous metals, in electrostatic precipitation, in the treatment of smelting slag producing low-concentration sulfur dioxide flue gas and in the treatment of the collected flue gas is not counted in the norm.

The quantity of water per unit of sulfuric acid product is calculated by formula (1) as $V_{ui} = V_i / Q$, where V_{ui} is the quantity of water per unit of product in cubic metres per tonne (m^3/t), V_i is the quantity of water used in production by the enterprise over the statistical reporting period of one year in cubic metres, and Q is the total quantity of sulfuric acid produced over that period, on a 100 % mass fraction basis, in tonnes.

Water from unconventional sources is converted with a factor of 0.8, that is the quantity of unconventional water is multiplied by 0.8 to give the equivalent quantity of conventional water.

Where several products share a demineralised water station or a boiler, the demineralised water, the steam and the steam condensate are apportioned from measured data; where several products share a circulating water system, the make-up water is apportioned in proportion to the circulating water; and where the enterprise makes several products, the water of the ancillary production system is apportioned in proportion to the water each product draws directly from the main and auxiliary production systems.

5 Values of the mandatory water intake norm

The water intake of industrial sulfuric acid production enterprises shall comply with Table 1, in cubic metres per tonne of sulfuric acid, by raw material and by grade.

Grade 1: not more than 1.1 m^3/t from sulfur, 1.5 m^3/t from pyrite, 1.5 m^3/t from non-ferrous metal smelting flue gas and 3.7 m^3/t from gypsum. Grade 2: not more than 1.5 m^3/t from sulfur, 2.4 m^3/t from pyrite, 2.3 m^3/t from non-ferrous metal smelting flue gas and 4.3 m^3/t from gypsum.

New enterprises, and rebuilt or extended enterprises whose main production water use is affected, shall reach the grade 1 values; existing enterprises shall reach the grade 2 values.

6 Management requirements

Enterprises able to be supplied with unconventional water shall use it in preference.

The water intake and water use metering system shall be sound, each kind of water being metered separately by source; water using units and sub-units shall be 100 % equipped with metering instruments, which shall be verified or calibrated as required and shall meet GB/T 24789 and GB/T 28714 on the provision and verification of metering instruments.

Original records and statistical ledgers of water use shall be kept, and the water of the main, auxiliary and ancillary production systems shall be compiled at regular intervals.

Enterprises whose water intake reaches the abstraction threshold shall install online metering equipment and transmit the readings of the primary water meter to the competent water administration department or to the Yellow River basin management body.

The water using installations shall be inspected and maintained so that running, overflowing, dripping and leaking are eliminated; a water balance test shall be carried out at suitable intervals and shall meet GB/T 12452.

The cooling water of production equipment, the cooling water of central air conditioning and the boiler condensate shall be recovered and reused.

Landscaping shall use efficient water-saving irrigation such as sprinkler or micro-irrigation, and water-saving domestic fittings complying with the corresponding product standards shall be used.

An enterprise whose water intake per unit of sulfuric acid product reaches the grade 1 value is regarded as having achieved an advanced level of water efficiency.

7 Implementation of the standard

The grade 2 values specified in this document apply from the thirteenth month after the date on which it is issued.