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Flue gas desulfurization gypsum

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Table of Contents

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Grading and marking.....	4
4 Technical requirements.....	4
5 Test method.....	5
6 Inspection rules	7
7 Packaging, labeling, transportation and storage	8

Flue gas desulfurization gypsum

1 Scope

This standard specifies the classification and labeling, technical requirements, test methods, inspection rules and packaging, marking, and transportation and storage of flue gas desulfurization gypsum.

This standard applies to flue gas desulfurization gypsum that adopts limestone/lime - gypsum wet method to desulfurize and purify sulfur-containing flue gas, so as to produce the main component of calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$).

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest version (including all amendments) applies to this document.

GB/T 176 Methods for chemical analysis of cement

GB/T 2007.1 General rules for the sampling and sample preparation of minerals in bulk - Sampling by manual method

GB/T 5484 Methods for chemical analysis of gypsum

3 Grading and marking

3.1 Grading

Products are mainly divided into three grades: Grade 1, Grade 2, and Grade 3 according to the content of calcium sulfate dihydrate.

3.2 Marking

It shall be marked in the order of product name, grade and standard number.

Example: For Grade 1 flue gas desulfurization gypsum, it is marked as follows:

Flue gas desulfurization gypsum Grade 1 GB/T 37785-2019

4 Technical requirements

The technical requirements for flue gas desulfurization gypsum shall meet the

$$w(\text{CaSO}_4 \cdot 2\text{H}_2\text{O}) = \frac{w_c}{20.9275} \times 100\% \quad \dots\dots\dots (1)$$

Where,

$w(\text{CaSO}_4 \cdot 2\text{H}_2\text{O})$ – Content of calcium sulfate dihydrate (mass fraction), %;

w_c – Content of crystal water (mass fraction), %;

20.9275 -- The conversion factor of crystal water content to calcium sulfate dihydrate content.

The calculation result is accurate to 0.01%.

5.4 Chloride ion (Cl⁻)

Measured according to the method specified in GB/T 176. The calculated results are expressed in milligrams per kilogram (mg/kg).

The calculation result is accurate to 1 mg/kg.

5.5 Calcium sulfite hemihydrate (CaSO₃•1/2H₂O)

Determine the sulfur dioxide content (mass fraction) $w(\text{SO}_2)$ according to the method specified in GB/T 5484. Calcium sulfite hemihydrate content (mass fraction) by Formula (2) calculation:

$$w(\text{CaSO}_3 \cdot 1/2\text{H}_2\text{O}) = w(\text{SO}_2) \times 2.016 \quad \dots\dots\dots (2)$$

Where,

$w(\text{CaSO}_3 \cdot 1/2\text{H}_2\text{O})$ – Content of calcium sulfite hemihydrate (mass fraction), %;

$w(\text{SO}_2)$ – Content of sulfur dioxide (mass fraction), %;

2.016 -- The conversion factor of sulfur dioxide content to calcium sulfite hemihydrate content.

The calculation result is accurate to 0.01%.

5.6 Water-soluble magnesium oxide (MgO)

Measure according to the method specified in GB/T 5484.

The calculation result is accurate to 0.01%.

5.7 Water-soluble sodium oxide (Na₂O)

Measure according to the method specified in GB/T 5484.

The calculation result is accurate to 0.01%.

5.8 pH value

Measure according to the method specified in GB/T 5484.

The result is accurate to 0.1.

6 Inspection rules

6.1 Inspection classification

6.1.1 Exit-factory inspection

The exit-factory inspection items are: attached water content, calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), and chloride ion (Cl^-).

6.1.2 Type inspection

The type inspection items are all the technical requirements stipulated in Chapter 4.

In one of the following situations, the type inspection of the product shall be carried out:

- a) When there are major changes in raw materials, processes or equipment;
- b) When the production-line is discontinued for more than half a year and then the production is resumed;
- c) Once a year during normal production.

6.2 Batching and sampling

6.2.1 Batching

For a manufacturing organization with an annual output of flue gas desulfurization gypsum less than 50,000 tons, no more than 150 tons is deemed as a batch; for a manufacturing organization with an annual output of 50,000 tons ~ 100,000 tons, no more than 300 tons is deemed as a batch; for a manufacturing organization with an annual output of 100,000 tons ~ 200,000 tons, no more than 500 tons is deemed as a batch; for a manufacturing organization with an annual output of more than 200,000 tons, no more than 800 tons is deemed as a batch. Each batch is deemed as a serial number; if there is less than one batch, it is deemed as a batch.

6.2.2 Sampling

Sampling shall be carried out according to the method specified in GB/T 2007.1; the total sampling amount of each batch shall not be less than 2kg. Divide the sample into

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