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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 45920-2025

Ferro-sulphoaluminate cement

铁铝酸盐水泥

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Table of Contents

1 Scope

This document specifies the classification and codes, components and materials, grades, technical requirements, test methods, inspection rules, as well as packaging, marking, transportation and storage of ferro-sulphoaluminate cement.

This document is applicable to the production and acceptance of ferro-sulphoaluminate cement.

2 Normative References

GB/T 203

GB/T 205

GB/T 1346

GB/T 2419

GB/T 5483

GB/T 5762

GB/T 8074

GB/T 9774

GB/T 12573

GB/T 17671

GB/T 18046

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Ferro-Sulphoaluminate Cement Clinker

A product obtained by burning a raw mix of appropriate composition to the point of partial fusion, the main mineral constituents of which are anhydrous calcium sulfoaluminate, calcium ferroaluminate, and dicalcium silicate.

3.2 Ferro-Sulphoaluminate Cement

A hydraulic cementing material produced by the co-grinding of clinker, an appropriate amount of gypsum, and/or blending materials.

4 Classification and Codes

Ferro-sulphoaluminate cement is classified by properties into self-stressing ferro-sulphoaluminate cement (designated as S-FAC), rapid-hardening ferro-sulphoaluminate cement (designated as R-FAC), and erosion-resistant ferro-sulphoaluminate cement (designated as E-FAC).

5.1 Components

The components of ferro-sulphoaluminate cement shall comply with the provisions of Table 1.

Table 1 -- Components of Ferro-Sulphoaluminate Cement

5.2.1.1 The aluminum oxide content (mass fraction) of ferro-sulphoaluminate cement clinker

shall not be less than 24.0%, and the ferric oxide content (mass fraction) shall not be less than 5.0%.

5.2.1.2 In addition to meeting the requirements specified in 5.2.1.1, clinker used for the production of self-stressing ferro-sulphoaluminate cement shall have a silicon dioxide content (mass fraction) of no more than 10.5%, and the mass fraction ratio of aluminum oxide to silicon dioxide shall not be greater than 6.0.

5.3 Gypsum

5.3.1 Natural gypsum shall comply with the requirements specified in GB/T 5483 for Class A Grade I and Class G Grade II (inclusive) or higher.

5.3.2 Industrial by-product fluorogypsum shall have a calcium sulfate content (mass fraction)

of no less than 75% and, upon testing, shall be proven harmless to the properties of the cement.

5.4 Limestone

The calcium oxide content (mass fraction) shall not be less than 46.0%, and the aluminum oxide content (mass fraction) shall not be greater than 2.0%.

5.5 Granulated Blast Furnace Slag/Granulated Blast Furnace Slag Powder

5.5.1 The granulated blast furnace slag shall comply with the provisions of GB/T 203.

5.5.2 The granulated blast furnace slag powder shall comply with the provisions of GB/T 18046.

6.1 Self-Stressing Ferro-Sulphoaluminate Cement

Based on the 28-day self-stress value, it is classified into two self-stress grades. 3.0 and 4.0.

6.2 Rapid-Hardening Ferro-Sulphoaluminate Cement

Based on the 3-day compressive strength, it is classified into five strength grades. 32.5, 42.5, 52.5, 62.5, and 72.5.

6.3 Erosion-Resistant Ferro-Sulphoaluminate Cement

Based on the 28-day compressive strength, it is classified into three strength grades. 32.5, 42.5, and 52.5.

7.1.1 Alkali content

The alkali content (mass fraction) shall not exceed 0.50%, expressed as the calculated value of w(Na2O)+0.658xw(K2O).

7.1.2 Chloride ion content

The chloride ion content (mass fraction) shall not exceed 0.06%.

7.1.3 Fineness

Expressed as specific surface area, it shall not be less than 370 m2/kg.

7.1.4 Setting time

The initial setting time shall not be less than 40 min, and the final setting time shall not exceed 240 min. When requested by the demander, the setting time shall be determined through negotiation between the supply and demand sides.

7.1.5 Strength

The 7-day compressive strength shall not be less than 32.5 MPa, and the 28-day compressive strength shall not be less than 42.5 MPa.

7.1.6 Free expansion rate

The 7-day free expansion rate shall not exceed 1.30%, and the 28-day free expansion rate shall not exceed 1.75%.

7.1.7 Self-stress value

The self-stress values for each respective self-stress grade shall comply with the provisions of Table 2.

Table 2 -- Requirements for Self-Stress Values of Self-Stressing Ferro-Sulphoaluminate Cement 7.1.8 28-day self-stress increment rate The 28-day self-stress increment rate shall not exceed 0.010 MPa/d.

7.2.1 Fineness

Expressed as specific surface area, it shall not be less than 350 m2/kg. .....