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

GB 175-2023

Common portland cement

通用硅酸盐水泥

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Foreword

This document is drafted in accordance with the rules provided in GB/T 1.1-2020 Directives for standardization - Part

1.Rules for the structure and drafting of standardizing documents. This document replaces GB 175-2007 Common portland cements; compared with GB 175-2007, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Change the provisions on cement components (see 5.1;
5.1 of the 2007 edition);
- b) Delete the provisions on natural gypsum of "grade II and above" (see
5.2.2.1 of the 2007 edition);

- c) Change the technical requirements for granulated blastfurnace slag or granulated blastfurnace slag powder, fly ash, and pozzolanic materials (see 5.2.3, 5.2.4 and 5.2.5; 5.2.3 of the 2007 edition);
- d) Delete the provisions on "active mixed materials" and "inactive mixed materials" (see 5.2.4 of the 2007 edition);
- e) Change the requirements for limestone and sandstone, and add the inspection method for methylene blue value (see 5.2.6; 5.2.4 of the 2007 edition);
- f) Delete the "kiln dust" material (see

1 Scope

GB 175-2023 is the Chinese national standard on common portland cement, in the field of construction materials and building. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 27 November 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 June 2024. Classification: ICS 91.100.10, CCS Q11. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the classification, components and materials, strength grades, technical requirements, test methods, inspection rules and packaging, marking, transportation and storage of common portland cement. This document applies to common portland cement.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 176, Methods for chemical analysis of cement

GB/T 203, Granulated blastfurnace slag used for cement production

GB/T 750, Autoclave method for soundness of portland cement

GB/T 1345, The test sieving method for fineness of cement

GB/T 1346, Test methods for water requirement of normal consistency, setting time and soundness of the portland cement

GB/T 1596, Fly ash used for cement and concrete

GB/T 2419, Test method for fluidity of cement mortar

GB/T 2847, Pozzolanic materials used for cement production

3 Terms and definitions

No terms and definitions need to be defined in this document.

4 Classification

Common portland cement is divided into portland cement, ordinary portland cement, blastfurnace-slag portland cement, fly ash portland cement, pozzolana portland cement and composite portland cement according to the type and dosage of mixed materials. The components and codes of each type shall comply with the provisions of 5.1.

5 Components and materials

5.1 Components The components of common portland cement shall comply with the provisions of Table 1, Table 2 and Table 3, respectively.

5.2 Materials

5.2.1 Portland cement clinker The hydraulic cementitious material with calcium silicate as the main mineral component, which is obtained by grinding raw materials mainly containing CaO , SiO_2 , Al_2O_3 , and Fe_2O_3 into fine powder in appropriate proportions, and burning them until they are partially melted.

5.2.2 Gypsum

5.2.4 Fly ash Fly ash shall comply with the technical requirements (except for strength activity index and alkali content) specified in GB/T 1596. The ammonium ion content in fly ash shall not exceed 210 mg/kg.

5.2.5 Pozzolanic materials Pozzolanic materials shall comply with the technical requirements (except for the 28-day compression strength ratio of cement mortar) specified in GB/T 2847.

5.2.7 Cement grinding aids Grinding aids are allowed to be added during cement grinding, where the amount added shall not exceed 0.5% of the cement mass. The grinding aids shall comply with the technical requirements specified in GB/T 26748.

6 Strength grade

6.1 The strength of portland cement and ordinary portland cement is divided into six grades. 42.5, 42.5R, 52.5, 52.5R,

6.2 The strength of blastfurnace-slag portland cement, fly ash portland cement and pozzolana portland cement is divided into six grades. 32.5, 32.5R, 42.5, 42.5R,

7 Technical requirements

7.1 Chemical requirements Chemical requirements shall comply with Table 4.

7.2 Water-soluble chromium (VI) in cement Water-soluble chromium (VI) in cement shall comply with the requirements of GB 31893.

7.3 Alkali content The alkali content in cement shall be expressed as the calculated value of $w(\text{Na}_2\text{O}) + 0.658w(\text{K}_2\text{O})$. When the buyer requires low-alkali cement, it shall be determined through negotiation between the buyer and the seller.

7.4 Physical requirements

7.4.1 Setting time The initial setting time of portland cement shall be no less than 45 minutes, and the final setting time shall be no more than 390 minutes. The initial setting time of ordinary portland cement, blastfurnace-slag portland cement, fly ash portland cement, pozzolana portland cement and composite portland cement shall be no less than 45 minutes, and the final setting time shall be no more than 600 minutes.

7.4.2 Soundness

7.4.3 Strength The strength of common portland cement at different ages shall comply with the requirements in Table 5.

7.4.4 Fineness The fineness of portland cement is expressed in terms of specific surface area, which shall be no less than 300 m²/kg and no more than 400 m²/kg.

7.5 Limits of radionuclides The internal exposure index I_{Ra} shall not be greater than 1.0, and the external exposure index I_{r} shall not be greater than 1.0.

8 Test methods

8.1 Components Test according to GB/T 12960. During the determination, the measured data shall be rounded off.

8.2 Insoluble, loss on ignition, magnesium oxide, sulfur trioxide, chloride ion and alkali content Perform according to GB/T 176.

8.3 Water-soluble chromium (VI) in cement Follow the provisions in GB 31893.