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

GB/T 31545-2025

Replacing GB/T 31545-2015

Portland cement for nuclear power engineering

核电工程用硅酸盐水泥

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 31545-2015 "Silicate Cement for Nuclear Power Engineering". Compared with GB/T 31545-2015, the main differences are in the structural design. Aside from integration and editorial changes, the main technical changes are as follows:

- a) The "Calculation Formula" for clinker mineral composition has been deleted (see 4.1 in the 2015 edition);
- b) The technical requirements for "natural gypsum" have been changed (see 4.2, 2015 edition of 4.2);
- c) The technical requirements for "magnesium oxide" have been changed (see 6.1.1, 6.1 in the 2015 edition);
- d) Increased the limits and corresponding test methods for water-soluble chromium (VI) in nuclear power plant cement (see 6.2, 7.3);
- e) The technical requirements for "strength" have been changed (see 6.4.5, 6.10 in the 2015 edition);
- f) The technical requirements for "heat of hydration" have been changed (see 6.4.6, 6.11 in the 2015 edition);
- g) Increased limits on radionuclides in nuclear power plant cement and corresponding test methods (see 6.5, 7.10);
- h) The numbering and sampling rules have been changed (see 8.1, 2015 version 8.1);

1 Scope

GB/T 31545-2025 is the Chinese national standard covering the cement allowed in a nuclear structure - the composition and the strength, the heat of hydration limited so a thick section does not crack as it cures, and above all the chloride and the boron, cobalt and other elements that would become activated or attack the reinforcement. Issued on 31 October 2025, it takes effect on 1 November 2026, replacing GB/T 31545-2015.

This document specifies the composition, materials, codes, strength grades, and technical specifications of silicate cement for nuclear power engineering (hereinafter referred to as "nuclear power cement"). Requirements, test methods, inspection rules, delivery and acceptance, packaging, marking, transportation and storage. This document applies to nuclear power cement.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 176 Chemical Analysis Methods for Cement

GB/T 750 Test Method for Autoclaved Soundness of Cement

GB/T 1346 Test Methods for Standard Consistency Water Requirement, Setting Time and Soundness of Cement
GB/T 5483 Natural Gypsum

GB 6566 Limits of Radionuclides in Building Materials

GB/T 8074 Method for Determination of Specific Surface Area of Cement - Blaine Method

GB/T 9774 Cement Packaging Bags

GB/T 12573 Cement Sampling Method

GB/T 12959 Determination of heat of hydration of cement

GB/T 17671 Test method for strength of cement mortar (ISO method)

GB/T 21372 Silicate Cement Clinker

GB/T 26748 Cement Grinding Aids

GB 31893 Limits and Determination Methods for Water-Soluble Chromium (VI) in Cement

JC/T 603 Cement Mortar Drying Shrinkage Test Method

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Used in nuclear power engineering, it is made from silicate cement clinker of appropriate composition, with the addition of a suitable amount of gypsum, and finely ground to produce a product with moderate heat of hydration and low dryness. Hydraulic cementitious materials with low shrinkage.

4 Components and Materials

4.1 Clinker The content of tricalcium silicate (C3S) by mass fraction is not greater than 57.0%, and the content of tricalcium aluminate (C3A) by mass fraction is not greater than