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

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Fused zirconia

电熔氧化锆

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Foreword

This standard Annex A, Annex B normative appendix. This standard by the National Standardization Technical Committee Refractories and centralized. This standard was drafted. Zhengzhou Zhenzhong fused zirconium Co., Ltd., Fujian Sanxiang Advanced Materials Co., Ltd., Metallurgical Industry Information Standards Institute. The main drafters of this standard. Xu Baokui, Yuxin Meng, Ye Wang Dan, Choujin Hui, Gao Jianping. Fused zirconia

1 Scope

China's national product standard for fused zirconia. It specifies the classification, the requirements, the test methods, the inspection rules and the marking, packaging, transport and storage of zirconium oxide produced by electric arc fusion. Zirconia melts at about two thousand seven hundred degrees, which is higher than almost anything else that can be made in quantity, and that single fact is why it exists as an industrial material. It is used where nothing else survives: in the linings of glass melting furnaces, in continuous casting refractories where molten steel runs against it, in ceramic and metallurgical applications above the range of alumina, and as an abrasive and a pigment opacifier. Fusion is how the dense form is made - the oxide is melted in an electric arc furnace and solidified, giving large well-formed crystals with very little porosity, which is what gives the material its resistance to corrosion by molten glass and slag. The complication that dominates the material is that pure zirconia changes crystal structure on heating and cooling, and the transformation between the monoclinic and tetragonal forms involves a volume change of several per cent. A pure zirconia body therefore cracks itself apart the first time it is cycled through the transformation temperature - which is why zirconia is almost always stabilised with an additive that holds the high-temperature structure down to room temperature, and why the type and amount of stabiliser is the first thing a specification states. So the standard classifies the material by that, and sets the chemical composition including the stabiliser and the impurities that affect the refractoriness, the crystalline phases, the bulk density, the particle size, and the methods by which each is determined. Issued on 16 June 2011 and in force since 1 February 2012.

This standard specifies the terms and definitions fused zirconia, classification and grade, technical requirements, test methods, inspection rules, packaging, labeling, Transport, storage and quality certificate. This standard applies to monoclinic and partially stabilized fused zirconia refractory materials and ceramic industries use.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 4984 Chemical analysis of zirconium-containing refractories

GB/T 5071 Refractory true density

GB 6566 building materials radionuclide limits

GB/T 17617 refractory raw materials and monolithic refractories sampling

GB/T 21114 refractory X-ray fluorescence spectroscopy for chemical analysis - cast glass method YB/T 5142 metallurgical mineral packaging, labeling, transportation, storage and quality certificate

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Fused zirconia is zircon sand (formula. $ZrSiO_4$) main raw material, carbon material as a reducing agent in an electric arc furnace in the reduction of zircon sand Desilication by blowing or casting off after generating zirconium silicon, it is also referred to as silica zirconium or fused silica zirconium.

3.2 Stabilization rate rate of stabilization Fused zirconia into monoclinic polymorph according to phase (mZ), tetragonal (tZ), cubic phase (cZ), in which the tetragonal phase, the cubic phase is stable. The stability of fused zirconia in order to stabilize the rate, said.

Stabilization rate (%) = [(cubic tetragonal phase)/(cubic tetragonal monoclinic)] x 100

4 Classification and designation

4.1 Classification Fused zirconia into monoclinic and partially stabilized type two categories. Zirconia partially stabilized by the stabilizer used is divided into type calcium (Ca yttrium complex) stabilized zirconia, magnesium (Mg composite yttrium) oxide stabilized Zirconia, yttria-stabilized zirconia and the like. Grade

4.2 Grades from English letters and numbers. Z is the English "zirconia" prefix, P is the English "partial" prefix, C, M, Y, respectively