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

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Magnesium aluminate spinel

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Foreword

This standard by the National Standardization Technical Committee Refractories and centralized. This standard is mainly drafted by: Haicheng City Huayin Group, Chun Sheng Industrial Co., Ltd. Henan, Kaifeng special resistance Co., Ltd., Jiangsu Jingxin High Temperature Materials Co., Ltd., Metallurgical Industry Information Standards Institute. The main drafters of this standard. Baiyin Chang, Fengzhen De, Lizheng Kun, Zhangzhang Xi, Chou Jinhui, Zhang Jiaqin, Gao Jianping, on behalf of John letter. Spinel

1 Scope

China's national product standard for magnesium aluminate spinel. It specifies the classification, the requirements, the test methods, the inspection rules and the marking, packaging, transport and storage of the refractory raw material formed from magnesia and alumina. Spinel is what the refractory industry moved to when it had to stop using chrome. Magnesite-chrome brick was the standard lining for cement rotary kilns and for many high-temperature furnaces, and it worked well - but the chromium in it converts under alkaline and oxidising service conditions to hexavalent chromium, which is water-soluble, carcinogenic and leaches from the spent brick, turning a routine relining into hazardous waste disposal. Magnesite-spinel replaced it, and the material's own properties are the reason the substitution succeeded rather than merely being tolerated. Spinel has a high melting point, it resists attack by the alkali salts that circulate in a cement kiln and by basic slags, and - most usefully - its thermal expansion differs from that of the magnesite grains around it, so a spinel-containing brick develops a fine network of microcracks that absorbs thermal shock instead of transmitting it as a single fracture. A cement kiln lining is cycled hard, and that microcrack toughening is what lets it survive. So the standard distinguishes the fused and the sintered material and classifies by the magnesite-to-alumina ratio, which sets whether the product is magnesite-rich or alumina-rich and therefore where it is used, and it specifies the chemical composition, the impurities, the bulk density and the porosity, the phase composition and the grain sizing. Issued on 16 June 2011 and in force since 1

February 2012.

This standard specifies the terms and definitions spinel, classification, technical requirements, test methods, inspection rules, packaging, labeling, transportation, storage Deposit and certificate of quality. This standard applies to commercial alumina or bauxite, light burned magnesite as raw materials, sintering and fused magnesium aluminum production tip Spar.

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 2999 refractory particles of bulk density

GB/T 5069 Methods for chemical analysis of Mg-Al refractories

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 Chemical formula $MgAl_2O_4$ spinel $MgO \cdot Al_2O_3$ or one of.

3.2 Sintering process using synthetic spinel.

3.3 Synthesis process using fused spinel.

3.4 Magnesium-rich spinel magnesite-rich spinel Chemical composition MgO/Al_2O_3 molar ratio greater than 1 spinel.

3.5 Al-rich spinel alumina-rich spinel Chemical composition MgO/Al_2O_3 molar ratio of less than 1 spinel.

4.1 Classification

4.1.1 into the production process sintered and fused two kinds.