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Abrasion resistant refractory materials

耐磨耐火材料

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Abrasion resistant refractory materials

1 Scope

This Standard specifies the terms and definitions, classification and designation, technical requirements, test methods, quality assessment procedures, packaging, marks, transportation, storage and quality certificates for abrasion resistant refractory materials.

This Standard is applicable to the abrasion resistant refractory materials used for the equipment such as circulating fluidized bed boiler, municipal solid waste incinerator, industrial waste incinerator, medical waste incinerator, ordinary solid waste incinerator, hazardous waste incinerator, and petroleum catalytic cracking units.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2997, *Test method for bulk density, apparent porosity and true porosity of dense shaped refractory products*

GB/T 3001, *Refractory products - Determination of modulus of rupture at ambient temperature*

GB/T 4513.2, *Monolithic (unshaped) refractory products - Part 2: Sampling for testing*

GB/T 4513.3, *Monolithic (unshaped) refractory products - Part 3: Characterization as received*

GB/T 4513.5, *Monolithic (unshaped) refractory products - Part 5: Preparation and treatment of test pieces*

GB/T 4513.6, *Monolithic (unshaped) refractory products - Part 6: Measurement of physical properties*

GB/T 4984, *Chemical analysis of refractories containing zirconia*

GB/T 5070, *Magnesia-chrome refractories Methods for chemical analysis*

GB/T 30873, *Refractory materials - Determination of thermal shock resistance*

GB/T 50080, *Standard for test method of performance on ordinary fresh concrete*

YB/T 4130, *Refractory materials - Determination of thermal conductivity (calorimeter)*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 10325 as well as the followings apply.

3.1 abrasion resistant refractory material

refractory material with Al_2O_3 , SiC or SiO_2 as main components with excellent wear resistance under the conditions of use

4 Classification and designation

4.1 Abrasion resistant refractory materials are divided into four categories: abrasion resistant refractory bricks, abrasion resistant refractory castable, abrasion resistant refractory plastics and abrasion resistant refractory mud.

4.2 Abrasion resistant refractory bricks are divided into 7 designations according to physical and chemical indicators: NMZ-1, NMZ-2, NMZ-3, NMZ-4, NMZ-5, NMZ-6, NMZ-7.

4.3 Abrasion resistant refractory castable (applicable to circulating fluidized bed boilers and waste incinerators) is divided into 8 designations according to physical and chemical indicators: NMJ-1, NMJ-2, NMJ-3, NMJ-4, NMJ-5, NMJ-6, NMJ-7 and NMJ-8.

4.4 Abrasion resistant refractory castable and plastics (applicable to petroleum catalytic cracking units) are divided into 7 designations according to physical and chemical indicators: NM-A, NM-B1, NM-B2, NM-C1, NM-C2, NM-C3, NM-C4.

4.5 Abrasion resistant refractory plastics are divided into 7 designations according to physical and chemical indicators: NMK-1, NMK-2, NMK-3, NMK-4, NMK-5, NMK-6, NMK-7.

4.6 Abrasion resistant refractory mud is divided into 4 designations: NMN-1, NMN-2, NMN-3, NMN-4 according to physical and chemical indicators.

4.7 In the designation, NM is the initials for Nai Mo (Chinese Pinyin, meaning abrasion resistant); Z, J, K, and N are the initials of Chinese Pinyin for brick, castable, plastic, and mud respectively. Among the designations in Table 3, A, B, and C are high abrasion resistant, abrasion resistant, and heat insulation abrasion resistant respectively. The following number is the product serial number.

5 Technical requirements

5.1 The physical and chemical indicators of abrasion resistant refractory bricks shall meet the requirements of Table 1.

5.2 The physical and chemical indicators of abrasion resistant refractory castable (applicable to circulating fluidized bed boilers and waste incinerators) shall meet the requirements of Table 2.

5.3 The physical and chemical indicators of abrasion resistant refractory castable and plastics (applicable to petroleum catalytic cracking units) shall meet the requirements of Table 3.

5.4 The physical and chemical indicators of abrasion resistant refractory plastics shall meet the requirements of Table 4.

5.5 The physical and chemical indicators of abrasion resistant refractory mud shall meet the requirements of Table 5.

5.6 The allowable size deviation and appearance of abrasion resistant refractory bricks shall meet the requirements of Table 6.

6.8 The thermal shock resistance is determined according to GB/T 30873.

6.9 The determination of the permanent heating line change and the recommended maximum use temperature shall be carried out in accordance with GB/T 5988.

6.10 The thermal conductivity can be determined by GB/T 5990, GB/T 22588 and YB/T 4130 according to the material and thermal conductivity.

6.11 The determination of the starting temperature of abrasion resistant refractory bricks under load is carried out according to GB/T 5989.

6.12 The size, appearance and cross-section inspection of abrasion resistant refractory bricks shall be carried out according to GB/T 10326.

6.13 The determination of the initial setting time and final setting time of abrasion resistant refractory castable is carried out according to GB/T 50080.

6.14 The plasticity index of abrasion resistant refractory plastics is determined according to GB/T 4513.3.

6.15 The bonding time of abrasion resistant refractory mud is determined according to GB/T 22459.3.

6.16 The determination of the particle size distribution of abrasion resistant refractory mud is carried out in accordance with GB/T 22459.5.

7 Quality assessment procedure

7.1 Batching

Products are batched according to the same designation. Each batch of abrasion resistant refractory bricks does not exceed 150t. Abrasion resistant refractory castable and abrasion resistant refractory plastics do not exceed 100t per batch. Each batch of abrasion resistant refractory mud does not exceed 30t. When raw materials or production processes are changed, separate batching shall be made.

7.2 Rules for sampling and qualification determination

7.2.1 Sampling acceptance of abrasion resistant refractory bricks shall be carried out according to GB/T 10325. Sampling of abrasion resistant refractory castable, abrasion resistant refractory plastics and abrasion resistant refractory slurries shall be conducted in accordance with GB/T 4513.2.

7.2.2 The product acceptance inspection items are as follows:

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