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

GB/T 1596-2017

Replacing GB/T 1596-2005

Fly ash used for cement and concrete

用于水泥和混凝土中的粉煤灰

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 1596-2005 Fly ash used for cement and concrete. Compared with GB/T 1596-2005, the main technical changes in this Standard are as follows: - modified "reference sample. complies with GSB 14-1510 Cement standard sample used for strength testing" to "reference cement. Portland cement or ordinary Portland cement that complies with GSB 14-1510, or is of strength grade of

42.5 specified in GB 175 and this Standard" (see

3.2 of this Edition,

3.2 of Edition 2005); - in technical requirements, added indicators of "SiO₂, Al₂O₃, Fe₂O₃ total mass fraction, density and strength activity" in "mixed fly ash for concrete and mortar"; the Grade II fly ash fineness index was modified from "45µm square hole sieve residue is not greater than 25%" to "45µm square hole sieve residue is not greater than 30%"; Grade III fly ash loss was modified from "not greater than 15.0%" to "not greater than 10.0%" (see

6.1 of this Edition,

6.1 of Edition 2005); - in technical requirements, added indicators of "SiO₂, Al₂O₃, Fe₂O₃

total mass fraction and density" in "fly ash used for cement activity mixed materials" (see 6.2 of this Edition); - modified the radioactive indicators from "qualified" to "meet building body material requirements in GB 6566" (see

6.2 of this Edition,

6.3 of Edition 2005); - when using dry or semi-dry desulfurization process, the resulting fly ash shall be subjected to the detection of hemihydrate calcium sulfite content; added specified indicators and test methods (see

7.5 of this Edition); - added radioactive test sample ratio (see

7.9 of this Edition); - modified the reference cement mortar fluidity in fly ash water ratio test from "130mm ~ 140mm" to "145mm ~ 155mm"; modified the test procedures at the same time (see Annexes A.3 and A.5 of this Edition; Annexes B.3 and B.5 of Edition 2005). This Standard was proposed by China Building Materials Federation. This Standard shall be under the jurisdiction of National Technical Committee on Cement of Standardization Administration of China (SAC/TC 184). Main drafting organizations of this Standard. China Building Materials Academy, Yangtze River Water Resources Commission Academy of Sciences of the Yangtze River, Shanghai Academy of Building Research, China Three Gorges Corporation, Zhuzhou Hongxin Special Building Material Co., Ltd., Xiamen ISO Standard Sand Co. Ltd. The drafting organizations of this Standard. Yuanbaoshan Power Co., Ltd., Huadian Power International Co., Ltd., Zouxian Power Plant, Sichuan Tao Feng Fly Ash Trade Co., Ltd., Guizhou Mingchuan Fly Ash Co., Ltd., Xuanwei Power Fly Ash Development Co., Ltd., Shenzhen Weihai Building Materials Co., Ltd., Shanghai Construction Materials Co., Ltd., Jiangsu Huanghai Cement Co., Ltd., Xinjiang Tianshan Cement Co., Ltd., Shandong Zhuozhou Cement Co., Ltd., Ningbo Xinhai Construction Materials Testing Co., Ltd., Shanghai Bridge Industrial Co., Ltd., Yunnan Building Materials Products Quality Inspection Institute, Inner Mongolia Building Materials Product Quality Inspection Institute. Main drafters of this Standard. Jiang Lizhen, Zhu Wenshang, Wang Shuyin, Du Yong, Yang Lixiang, Li Wenwei, Yan Jianjun, Shen Yanjun, Chen Guiquan, Li Laifang, Xue Yueyu, Yu Haibo, Wu Baohua, Zhu Mintao, Deng Minhui, Wang Jianbiao, Li Xihua, Chen Wenyao, Gong Bo, He Jiangfang, Wu Feicai, Gao Huijuan, He Jun, Liu Qingbin, Lin Maosong, Ma Zhaomu, Wang Xingqin, Ren Fenmei. Versions of standard substituted by this Standard are. - GB/T 1596-1979, GB/T 1596-1991, GB/T 1596-2005. Fly ash used for cement and concrete

1 Scope

GB/T 1596-2017 is the Chinese national standard on fly ash used for cement and concrete, in the field of construction materials and building. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers

meet it. It was issued on 12 July 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 June 2018. 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 Standard specifies the terms and definitions, classification, grade, technical requirements, test methods, inspection rules, packaging, marks, transport and storage of fly ash used for cement and concrete. This Standard is applicable to the fly ash used as admixture when mixing mortar and concrete as well as the fly ash used as active mixed material in cement production.

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 175, Common Portland Cement

GB/T 176, Method for Chemical Analysis of Cement

GB/T 208, STANDARD test method for cement density

GB/T 1345, The Test Sieving Method for Fineness of Cement

GB/T 1346, Standard test method for water requirement for normal consistency setting time and soundness of the Portland cement

GB/T 2419, Test method for fluidity of cement mortar GB/T 5484, Methods for chemical analysis of gypsum

GB 6566, Limits of radionuclides in building materials

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 fly ash powder collected in flue gas of pulverized coal stove of power plant

3.2 reference cement Portland cement or ordinary Portland cement that complies with GSB 14-1510, or is of strength grade of

42.5 specified in GB 175 and this Standard

3.4 reference mortar mixed by reference cement and specified grade standard sand

according to a mass ratio of 1.3

3.5 testing mortar mixed by testing sample and specified grade standard sand according to a mass ratio of 1.3

4 Classification

4.1 According to category of coal, it is divided into F type fly ash (fly ash collected from the burning of anthracite or bituminous coal) and C type fly ash (fly ash collected from the calcination of lignite or sub-bituminous coal; calcium oxide content is generally greater than or equal to 10%).

5 Grade

The fly ash used for mixing mortar and concrete is divided into three grades. I, II, III.

6 Technical requirements

6.1 Physical and chemical performance requirements The fly ash used for mixing mortar and concrete shall meet requirements of Table

1. The fly ash used for cement activity mixed materials shall meet requirements of Table 1.

6.2 Radioactivity Meet building body material requirements in GB 6566.

6.3 Alkali content Represented by the calculated value of $\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$. When there are requirements for alkali content in fly ash application, it shall be confirmed by the supplier and the purchaser.

7 Test methods

7.1 Fineness Carry out according to 45 μm negative pressure sieve method in GB/T 1345. Sieving time is 3 min.

7.2 Water demand ratio In accordance with Annex A.

7.3 Loss, sulfur trioxide, free calcium oxide, silicon dioxide, aluminum oxide, ferric oxide, alkali content shall be in accordance with GB/T 176.

7.4 Water content In accordance with Annex B.

7.5 Hemihydrate calcium sulfite In accordance with GB/T 5484.

7.8 Strength activity index In accordance with Annex C.

7.9 Radioactivity Mix well the fly ash and the Portland cement that meets GB 175 requirements according to a mass ratio of 1.1. Detect according to GB 6566.