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

GB/T 24175-2026

Replacing GB/T 24175-2009

Test method for the stability of steel slag

钢渣稳定性试验方法

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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 24175-2009 "Test Methods for Stability of Steel Slag". Compared with GB/T 24175-2009, the only changes are structural adjustments. Aside from editorial changes, the main technical changes are as follows:

---The scope of application has been changed (see Chapter 1, Chapter 1 of the 2009 edition);

---The terms and definitions for immersion swelling rate and autoclaving pulverization rate have been changed (see

3.1 and 3.2, 2009 editions of

---Added terms and definitions for boiling pulverization rate (see 3.3);

---A boiling tank and a crusher have been added (see

---The water bath curing temperature has been changed (see 5.1,.2009 edition of 5.1);

---The particle size distribution of the slag specimens with high water immersion expansion rate has been modified (see 5.2.3,.2009 version 5.2.3);

---A method for determining the boiling pulverization rate of steel slag has been added (see Chapter 7). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Iron and Steel Association. This document is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183). This document was drafted by: China Metallurgical Construction Research Institute Co., Ltd., Shougang Jingtang Iron & Steel Co., Ltd., and Shandong Jiuyang Group Co., Ltd. Limited Liability Company, Xinji Aosen Special Steel Group Co., Ltd., Zhongtian Steel Group (Nantong) Co., Ltd., China Metallurgical Energy Conservation and Environmental Protection Co., Ltd. Wuhan University of Technology, Baowu Environmental Science & Technology Wuhan Metal Resources Co., Ltd., Hebei Creative Feng New Materials Technology Co., Ltd., and MCC Changtian International Engineering Limited Liability Company, Beijing Shougang Resource Comprehensive Utilization Technology Development Co., Ltd., Beijing University of Science and Technology, Metallurgical Industry Information Standards Research Institute College, Yancheng Institute of Technology, Qingdao University of Technology. The main drafters of this document are. Zhang Liangliang, Lü Wen, Su Zijing, Peng D, Qiu Jinhui, Wang Haitao, Gan Wangui, Ma Hongzhi, Yang Bentao, and Wang Guolian. Wang Jiangwei, Wu Yuedong, Wu Shaopeng, Zhu Huajun, Zhang Hengqian, Yin Zhifeng, Xu Bozhang, Bian Jianhui, Dong Liyuan, Meng Libin, Yang Guang, Chen Jian, Zhang Xuekai Li Shibin, Zhang Ruopeng, Hao Yidang, Wang Fusong, Li Chunmei, Hu Xiantang, Han Huaibin, Yu Jingyao, Zhang Yang, Su Xiaofeng, Gong Yishan, Wang Dong, Zhang Qingjian Xu Haiqin and Bian Rongxing. The release history of this document and the document it replaces is as follows:

---First published in.2009 as GB/T 24175-2009;

---This is the first revision. Stability test method for steel slag

1.Scope This document specifies the instruments and equipment for steel slag stability testing, including the determination of immersion swelling rate, autoclaving pulverization rate, and boiling pulverization rate. Determination and test report. This document applies to the stabilization of converter steel slag and electric arc furnace steel slag. The method for determining the water immersion expansion rate is applicable to road subgrade and base course materials. Steel slag for building materials, steel slag for asphalt pavement aggregates, and steel slag for engineering backfilling; the autoclaving and pulverization rate method is applicable to steel slag used in building mortar and building materials. The boiling pulverization rate determination method is applicable to steel slag used for engineering

backfilling.

4 Instruments and Equipment

4.1 Weighing equipment The measuring range is not less than 20kg, and the minimum scale division is not greater than 10g. The measuring range is not less than 5kg, and the minimum scale division is not greater than 1g. The measuring range is not less than

0.5 kg, and the minimum scale division is not greater than

0.01 g.

4.2 Compaction Test Equipment Includes a metal cylinder with an inner diameter of 152mm and a height of 170mm, and an inner pad block with a sleeve height of 50mm, a diameter of 151mm, and a height of 50mm. The equipment includes a base and a compaction device. The compaction hammer has a base diameter of 50mm and a total mass of 4.5kg. The total stroke of the hammer within the guide tube is 450mm.

4.3 Perforated base It has supports on both sides and a perforated plate in the middle with 2mm round holes.

4.4 Perforated Top Plate It has a diameter of 148mm, is filled with 2mm round holes, and is made of stainless steel or brass with a threaded center hole.

4.5 Semi-circular load plate Hollow concentric semi-circular stainless steel plates with a diameter of 150mm and a thickness of 10mm, each with a hollow circle diameter of 52mm and a weight of 1.25kg.

4.6 Dial indicator stand and dial indicator The dial indicator has an accuracy of 0.01 mm.

4.7 Constant Temperature Water Bath Minimum dimensions of the water bath. 1100mm (length) x 330mm (width) x 350mm (height), with temperature control above 90°C. The apparatus for measuring water immersion swelling rate is shown in Figure 1.

4.8 Oven Temperature can be controlled at 105°C with an accuracy of no less than 5°C.

4.9 Filter paper Diameter 152mm.

4.10 Scraper

4.11 Pressure Cooker Design pressure. 2.5MPa; Working pressure. 2.0MPa; Working medium. saturated water vapor; Minimum volume. 0.0085m³.

4.12 Test sieves It conforms to the requirements of GB/T 6003.1 and GB/T 6003.2, with sieve aperture sizes of 31.5mm, 26.5mm, 19.0mm, and 16.0mm. 13.2mm, 9.5mm, 4.75mm, 2.36mm, 1.18mm, 0.3mm, 0.075mm.

4.13 Vibrating Screen The vibration frequency is 221 times/min.

4.14 Steamer tray The bottom has a circular sieve with 1.18mm mesh, a diameter of 100mm, a height of 90mm, and a cloth covering the sieve screen.

4.15 Boiling Chamber Boiling chamber that meets the requirements of JC/T 955.

4.16 Crusher Small jaw crusher.

5 Determination of the expansion rate of steel slag after immersion in water

5.1 Principle By using an 80°C water bath curing method, the free calcium oxide and free magnesium oxide in the steel slag are dissolved after a certain period of time, resulting in volume expansion. Expansion is used to assess the stability of steel slag by measuring the rate of volume change.

5.2 Sample Preparation

5.2.1 Take 100 kg of representative sample, dry it, and crush it until it all passes through a 31.5 mm square hole sieve for later use.

5.2.2 The crushed sample was passed through apertures of 31.5mm, 26.5mm, 13.2mm, 4.75mm, 2.36mm, 0.3mm, and 0.075mm. For square-hole sieves, place the sieve sleeve on a vibrating sieve machine and vibrate for 10 minutes; remove the sieve sleeve and sieve by hand one by one according to the sieve hole size until a speed of [number] passes per minute is achieved. The amount of sample passing through the sieve is reduced to less than 0.1% of the total sample volume. The passed sample is then added to the next sieve and sieved together with the sample in the next sieve, in this sequential order. Continue until all sieves have been used.

5.2.3 Prepare compacted test specimens according to the actual particle size distribution in the engineering project. If there are no specific requirements, test specimens can be prepared according to the particle size distribution in Table

1.For steel slag samples... If the maximum natural particle size is less than the maximum particle size in the first column of Table 1, prepare the sample according to the particle size distribution of the maximum particle size in the second column, and so on.

5.3 Test Procedure

5.3.1 Conduct a heavy compaction test according to the compaction test method in GB/T 50123 to determine the optimum moisture content and maximum dry density.

5.3.2 Weigh out 3 portions of steel slag, each weighing 7 kg, according to the particle size distribution requirements in Table