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GB/T 8074-2008

Replacing GB/T 8074-1987

Testing method for specific surface of cement - Blaine method

水泥比表面积测定方法 勃氏法

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Foreword

This Standard is revised by reference to ASTM C204 "Standard Test Methods for Fineness of Hydraulic Cement by Air-permeability Apparatus", JIS R5201 "Physical Testing Methods for Cement", and EN 196-6 "Methods of Testing Cement - Determination of Fineness".

This Standard replaces GB/T 8074-1987 "Method of Determination for Specific Surface of Cement - Blaine Method".

Compared with GB/T 8074-1987, the main changes in this Standard are as follows:

- added GB/T 208 "Standard Test Method for Cement Density" in Normative References (Chapter 2 in this edition);
- added GB/T 1914 "Chemical Analytical Filter Paper" in Normative References (Chapter 2 in this edition);
- added GB 12573 "Test Method for Sampling of Cement" in Normative References (Chapter 2 in this edition);
- added automatic specific surface area analyzer on the basis of original Blaine Method specific surface area analyzer (Article 5.1 in this edition);
- specified the area ratio of PI and PII cement 0.500, and the one of other cements 0.530 (Article 5.2 in Edition 1987, Article 7.3 in this edition);
- specified that a 2000g balance weight is used to press the temp when changing the area ratio (Article 7.3 in this edition);
- deleted Table 3 in Appendix A in the previous edition.

Appendix A and Appendix B in this Standard are informative.

This Standard was proposed by the China Building Materials Federation.

This Standard is under the jurisdiction of the National Technical Committee on Cements of Standardization Administration of China (SAC/TC 184).

Main drafting organization of this Standard: China Building Materials Academy

The drafting organizations of this Standard: Wuxi Jianyi Instrument & Machinery Co., Ltd., Shaoxing Kente Mechanical & Electrical Co., Ltd., Hebei Kexi Instrument & Equipment Co., Ltd.

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Testing method for specific surface of cement - Blaine method

1 Scope

This Standard specifies the method of determination for cement fineness with Blaine air permeability apparatus.

This Standard is applicable to the determination of specific surface area of cements and other powdery materials that this Standard applies whose specific surface is 2000 cm^2/g~ 6000 cm^2/g, and it is not applicable to the determination for cellular or micro-powdery material.

2 Normative references

The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. At the time of publication, the editions indicated are valid. All standards are subject to revision. The parties who are using this Standard shall explore the possibility of using the latest version of the following standards.

GB/T 208, *Standard Test Method for Cement Density*

GB/T 1914, *Chemical Analytical Filter Paper*

GB 12573, *Test Method for Sampling of Cement*

GSB 14-1511, *Standard Samples for Determination of Cement Fineness and Specific Surface*

JC/T 956, *Apparatus for Blaine method*

3 Principle

This method is to test specific surface area of cement based on the theory that the resistance of a specific amount of air, passing through the cement layer with specific area ratio and set thickness, results in the variance in flow rate.in a cement layer with a specific area ratio, the size and quantity of cavity is the function of particle size, and also decides the flow rate of the air through the material layer.

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level shall be used for instrument calibration. Where there is dispute about it, the former shall apply.

6.2 The calibration for instruments shall comply with the requirements of JC/T 956.

6.3 Calibration cycle

The calibration shall be conducted at least once yearly; where instruments and equipment are used frequently, they shall be calibrated one every half a year; the instruments after being repaired, shall be re-calibrated.

7 Operating procedures

7.1 Determination of cement density

The cement density determination shall comply with the requirements of GB/T 208.

7.2 Air leak detection

Chock the upper opening of the permeability cylinder with a rubber stopper, and connect the permeability cylinder to the pressure gauge; with the exhauster, drawn part of air out from a limb of the pressure gauge, close the valve, and observe the air-leak condition. In case of air leak, seal the air-leak position with piston oil.

7.3 Determination of area ratio (ε)

The area ratio of PI and PII cement shall be 0.500, and the one of other cements or fine materials shall be 0.530±0.005.

Where the test sample cannot be pressed to the position required in Article 7.5 by the above area ratio, the area ratio may be allowable to change.

The adjustment of the area ratio shall be subject to that the test sample is compacted (pressed) with a 2000 g balance weight (Level 5 balance weight) to the position specified in Article 7.5.

7.4 Determining the sample required amount

The amount of the sample required is calculated according to formula (1):

$$m = \rho V(1-\varepsilon) \qquad \cdots\cdots(1)$$

where,

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m - Amount of the sample required, (g);

ρ - Density of sample, g/cm^3;

V - Volume of sample material layer, tested according to the requirements of JC/T 956, and expressed in (cm^3);

E - Area ratio of sample material layer.

7.5 Preparation of sample material layer

7.5.1 Place the perforated plate on the flange of the permeability cylinder, place a filter papers with a tamping bar on the perforated plate, setting the edge hereof level and pressing solid; weigh and take cement of the amount specified in Article 5.2, accurate to 0.001g, and place it in a cylinder; tap the wall of the cylinder, to make the cement surface even; place another filter paper; compact the cement with a temp still the supporting ring closely contacts the top of the cylinder, rotating 1~2 cycles, and take the temp out slowly.

7.5.2 The filter paper on the perforated plate is a circular filter paper (φ12.7mm) with smooth edge; new one shall be used in each determination (test).

7.6 Air permeability test

7.6.1 Coat the lower cone of the permeability cylinder containing the sample material layer with a thin layer of grease;

7.6.2 Start the mini-type electromagnetic pump, draw air out from a limb of the pressure gauge still the liquid surface of the pressure gauge rises to the lower end of the enlarged part, and close the valve. begin timing when the crescent liquid level in the pressure gauge draws down to the first scale mark (see Figure 1) and stop timing when the crescent liquid level drops down to the second scale mark; record the time from the liquid level dropping down from the first scale mark to the second scale mark, and the temperature (°C) in the test. New sample material layer shall be prepared for each air permeability test.

8 Calculation

8.1 Where the density of the tested sample and the area ratio of the sample material layer are same to the ones of the standard sample and the difference between the temperature in the test and the base measuring temperature is not larger than 3°C, the specific area may be calculated according to formula (2).

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