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

GB/T 12959-2024

Replacing GB/T 12959-2008

Test methods for heat of hydration of cement

水泥水化热测定方法

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Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
3 Temperature of materials and utensils	2
3 Standard sand	2
4 Test Step	4
4 Test steps	8
3 Test steps	13
9 Result Processing	17
18 Appendix B (Normative) Calibration of Isothermal Calorimeter	20

Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting: This document replaces GB/T 12959-2008 "Method for determination of hydration heat of cement": Compared with GB/T 12959-2008, in addition to the structural adjustment In addition to editorial changes, the main technical changes are as follows:

- Added isothermal conduction calorimetry and listed it as the reference method (see Chapter 6);
- Changed the heat of solution method to the alternative method (see Chapter 7, Chapter 3 of the:2008 edition);
- Added the time requirement for adding mixed acid to the thermos flask when determining the heat of hydration by the heat of solution method (see 7:4:1:3);
- Added the following information when determining the heat of solution method for slag silicate cement and low-heat slag silicate cement: Method for calculating the ignition mass of cement for hydration test (see 7:4:2:4);
- Changed the requirements for re-determination of results by direct method (see 9:1, 4:5:15 of the:2008 edition);
- Added "Calibration of isothermal calorimeter" (see Appendix A);
- Added "Calibration of isothermal calorimeter" (see Appendix B): Please note that some of the contents of this document may involve patents: The issuing organization of this

document does not assume the responsibility for identifying patents: This document was proposed by China Building Materials Federation: This document is under the jurisdiction of the National Cement Standardization Technical Committee (SAC/TC184): Company, Beijing Jingangchangdao Engineering Construction Co., Ltd., Building Materials Industry Technical Supervision Research Center, China Railway 17th Bureau Group Co., Ltd., Beijing Construction Group Co., Ltd., China Railway Construction Technology Testing Co., Ltd., Anhui Jinhuang Construction Group Co., Ltd., Jiangsu Shanhe Cement Co., Ltd. company: The main drafters of this document are: Guo Junping, Li Xiangquan, Liu Jiwei, Wang Faming, Shen Jing, Wu Qijian, Wang Xinyu, Zhang Yulu, Huang Jianshan, Cui Yong, Song Shixing, Gao Shenghui, Deng Lei, She Hailong, Zhu Mintao, Liu Tan, Xiao Zhongming, Yin Aiguo, Ding Qingjie, Li Tianyan, Wang Zhengsong, Wang Junyong, Zhang Yanping, Hu Houlan, Chen Shan, Dong Zhijun, Long Wujian, Ren Hao, Li Guangke, Zhang Chao, Zhang Ping, Gong Ying, Sun Xuemei, Qin Hongzhu, Luo Wei, Chen Xuemei, Wang Yichun, Zhong Na, Yang Peng, Lü Jungang, Wang Xuechuan, Cai Xueling, Wang Hongxia, Du Zengqiang, Lu Dehua, Sheng Yan, Jin Jianzhou, Yu Yongjin, Li Xudong, Wang Zhizhong, Ding Xiaoping, Zheng Meichun, Shao Peng, Li Shuyao, Feng Guohua, Bu Yunbing, Du Wei, Xue Mengbin, Xie Haiwang, Wen Xiaoshun, Li Binqun, Hu Yin, Li Hu, Zhang Shouqi, Chen Bing, Zhao Xuefeng, Kong Haixia, Yang Chunxi, Lu Weijie, You Haishi, Guan Tongqiang, Di Liyu, Chen Feixiang, Yang Xinmin, Chen Peng, Chen Jianfu, Wang Hao, Hu Mingwen, Wang Lubo, Ke Shanglin, Pang Yi, Li Yameng, Huang Xiaotao, Yu Yuanyuan, Chen Hongwei, Zhen Zhilu, Li Danggang, Tong Lin, Feng Weipeng, Yan Zhi, Liang Hongtao, Tian Jing, Lei Yingqiang, Liu Qiu Hai, Zhang Jiaqing, Ren Lijuan, Li Guyuan, Li Caisi, Cao Jianming: The previous versions of this document and the documents it replaces are as follows:

---First published in:1991 as GB/T 12959-1991 "Determination of heat of hydration of cement (heat of solution method)";

--- In the first revision in:2008, GB/T 2022-1980 "Test method for heat of hydration of cement (direct method)" was incorporated;

---This is the second revision:

GB/T 12959-2008 "Methods for determination of cement hydration heat" includes two methods for determination of cement hydration heat: dissolution heat method and direct method: The heat of solution method is the reference method: Compared with the previous version of the standard, this document includes three methods for determining the heat of cement hydration: isothermal conduction calorimetry, The calorimetric method and the direct method are used, and the isothermal conduction calorimetry is used as the benchmark method: This is based on the comparison of the three measurement methods: The results of cement hydration heat are determined with the highest accuracy; in case of dispute, the results of the benchmark method shall prevail; quality control of daily production and application When making the test, all three methods can be used: The promulgation and implementation of this document provides market players with an

advanced method for determining the heat of cement hydration, while also improving the physical properties of cement testing: The automation and intelligence level of the test is improved, and the test results can better guide the concrete mixing work: More importantly, the test process is convenient to operate and people It ensures personal safety and environmental safety, greatly reducing the measurement errors caused by personnel: Method standards serve product standards: In order to ensure the implementation of this document in conjunction with relevant product standards and specifications, the relevant Standards and specifications, the version before the implementation of this document is based on the heat of solution method, the relevant standards and specifications after the implementation of this document are based on Isothermal conduction calorimetry is used as the benchmark: Before the relevant standards and specifications of this document are revised, the specific technical indicators shall be subject to acceptance by both parties: The negotiated values shall be used as the basis for judgment; after the revision work is completed, the technical indicators of relevant standards and specifications shall be used as the basis for judgment: Method for determination of heat of hydration of cement

1 Scope

GB/T 12959-2024 is the Chinese national standard on test methods for heat of hydration of cement, 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 25 April 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2024. 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 document describes the test conditions, materials, isothermal conduction calorimetry, heat of solution method, direct method, result processing and other methods for determining the heat of hydration of cement: Reasoning and accuracy, etc: This document is applicable to the determination of cement hydration heat: Among them, the isothermal conduction calorimetry is used as the reference method, and the solution heat method and direct method are used as substitutes: usage:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document: For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced

documents without a date, the latest version (including all amendments) applies to This document:

GB/T 176 Chemical analysis methods for cement

GB/T 1346 Test methods for water consumption, setting time and stability of cement of standard consistency

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 17671 Test method for strength of cement mortar (ISO method) JC/T 681 Planetary cement mortar mixer

3 Terms and definitions

The following terms and definitions apply to this document:

3:1 baselineoutput When the test sample cell and the reference sample cell contain test water and reference water with the same heat capacity, the isothermal conduction calorimeter changes with time: The output signal of the 3:

2 Baseline drift During the measurement, the slope of the linear regression of the baseline output versus the measurement time: 3:3 baselinenoise The standard deviation of the baseline output over time during the measurement: 3:

4 Thermal power The rate of heat release of the test cement during the measurement period: 3:

5 Calibration Using a heat source with known thermal power, a linear relationship between the automatic acquisition voltage of the data logger and the output thermal power of the isothermal calorimeter is established: