

ICS 27.010
CCS F 04



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

GB/T 8174-2025

Replacing GB/T 8174-2008

**Method of measuring and evaluating thermal insulation effects
for equipment and pipes**

设备及管道绝热效果的测试与评价

Issued on: October 31, 2025

Implemented on: May 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 4 Test Methods
- 4.1 External Surface Temperature Test Method

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 8174-2008 "Test and Evaluation of Thermal Insulation Effects of Equipment and Piping". Compared with GB/T 8174-2008, Apart from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The testing grading requirements have been changed (see 5.1, 5.2 in the.2008 version);
- b) The requirements for testing equipment have been changed (see 5.3, 5.4 in the.2008 edition);
- c) The selection of test subjects has been expanded (see 5.4);
- d) The requirements for measuring point layout have been changed (see 5.5,.2008 version 5.5);
- e) Test condition requirements have been changed (see 5.7,.2008 version 5.7);
- f) The data acquisition and processing requirements have been changed (see Chapter 7, Chapter 7 of the.2008 edition);
- g) The measurement uncertainty requirements have been changed (see Chapter 8, Chapter 8 of the.2008 edition);
- h) The requirements for engineering quality analysis for evaluating insulation performance have been changed (see Chapter 9, Chapter 9 of the.2008 edition). 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 and is under the jurisdiction of the National Technical Committee on Standardization of Energy

Infrastructure and Management (SAC/TC20). This document was drafted by: Building Materials Industry Technology Supervision and Research Center, Zhejiang Aske Building Materials Technology Co., Ltd., and Winsun Energy Conservation. Group Co., Ltd., Beijing Construction Engineering Quality Fourth Testing Institute Co., Ltd., Dalian Guangmingyuan Energy Conservation Technology Research and Testing Center Co., Ltd. The company, Anhui Shihua Engineering Technology Co., Ltd., Zhejiang Zhenshen Thermal Insulation Technology Co., Ltd., China Chengda Engineering Co., Ltd., Shanghai Jianke Inspection Co., Ltd., Huamei Energy-Saving Technology Group Co., Ltd., China Construction Fourth Engineering Bureau Installation Engineering Co., Ltd., Beijing Dongfang Huazhi Petroleum Engineering Limited Liability Company, China Power Engineering Consulting Group Southwest Electric Power Design Institute Co., Ltd., Alessi Thermal Insulation Materials (Guangzhou) Co., Ltd., Donghua Engineering Cheng Technology Co., Ltd., Hualu Engineering & Technology Co., Ltd., China Wuhuan Engineering Co., Ltd., Beijing Petrochemical Engineering Co., Ltd. Company, Saiding Engineering Co., Ltd., Dehe Technology Group Co., Ltd., China Tianchen Engineering Co., Ltd., Shenzhou Energy Conservation Technology Group Co., Ltd. Company, Jiangsu Shengtai Energy Network Technology Co., Ltd., Guangdong Elisheng Technology Co., Ltd., Jiangsu Hanxin Tiancheng New Materials Co., Ltd., China Petroleum Chemical Engineering Construction Co., Ltd., Zhejiang Iwatani Technology Co., Ltd., Tianjin Huali Insulation Building Materials Co., Ltd., China Chemical Engineering Sixth Construction Co., Ltd. Limited Liability Company, Zhongji Petrochemical Engineering Design Co., Ltd., Zhejiang Chuangxiang Energy Saving Technology Co., Ltd., Zhejiang Urban Construction Gas and Thermal Power Design Institute Co., Ltd. Limited Liability Company, Wuhan Yiye Steel Structure Co., Ltd., Tianjin Jineng Pipe Industry Co., Ltd., Anhui Honghui Technology Co., Ltd., Zhongke Runzi (Chongqing) Energy Saving Technology Co., Ltd., Hebei Huidong Pipeline Co., Ltd., Luoyang Zhida Petrochemical Engineering Co., Ltd., China Jiliang University Hebei Installation Engineering Co., Ltd., Nanjing Institute of Technology, Tianjin Zhonghao Heating Engineering Co., Ltd., and Shanghai Haiweister Technology Co., Ltd. The main drafters of this document are. Hao Yunan, Jin Fujin, Qiu Yiqi, Zhang Jun, Wu Shouyong, Hu Xianlin, Bai Dongjun, Zhang Zhenyu, Zhang Chunhua, and Yang Xuefei. Ling Wei, Gao Kun, Xie Cunjian, Yang Pingwei, Lü Bo, Su Jun, Gao Heqing, Song Lingzhen, Wu Yuefeng, Ye Yaqin, Luo Caiping, Guo Weijiang, Fu Junming, Yang Jie Sun Zezhan, Zhang Jianqiang, Yang Lili, Gao Jingsheng, Xing Gaoshan, Wang Zhiqiang, Guan Jinguo, Cheng Qinghua, Mao Yuhai, Yang Shijie, Wu Yuelin, Peng Quanzhou Wang Li, Xie Mingsheng, Wang Shuqun, Lu Congming, Yuan Bing, Dan Liangfeng, Zhang Xuefeng, Pang Guan, He Xudong, Chen Yong, Zhao Keren, Hong Shuquan, Li Wenhui, Fang Wei Gao Yangyang, Zhang Yanfeng, Cen Zhichao, Chen Dong, Huang Yaohe, Zhou Hongdong, Wang Yi, Zhu Mengwei, Pang Ning, Bai Yuanyu, Wang Hongjun, Li Huanan, Yan Jianguo Zhang Guoyou, Zhang Guoyong, Mao Yichao, Sun Bo, Li Lei. The release history of this document and the document it replaces is as follows:

---First published in 1987 as GB/T 8174-1987;

---When it was first revised in 2008, it was incorporated into GB/T 16617-1996 "Test and Evaluation of Cold Insulation Effect of Equipment and Pipelines";

1 Scope

GB/T 8174-2025 is the Chinese national standard covering measuring how well insulation on a plant actually performs - the surface temperature survey and the heat flow measurement, the ambient conditions recorded with it, the loss per metre or per square metre calculated, and the judgement against the design value. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 8174-2008.

This document specifies the testing methods, requirements, organization and preparation, data acquisition and processing for the insulation performance of equipment and pipelines. Measurement uncertainty, insulation effect evaluation, engineering quality analysis and test evaluation report. This document applies to the testing and evaluation of the insulation performance of equipment, pipelines and their accessories at temperatures ranging from -196°C to 850°C. This document does not apply to equipment and pipelines with special requirements in construction, cold storage, and systems such as nuclear energy, aviation, and aerospace.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 4272 General Technical Specifications for Thermal Insulation of Equipment and Piping

GB/T 8175 Guidelines for Insulation Design of Equipment and Piping

GB 50264 Code for Design of Thermal Insulation Engineering for Industrial Equipment and Piping

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Heat loss The surface heat flux density or linear heat flux density that the outer surface of an insulating structure loses (or absorbs) from the surrounding environment.

4.1 External Surface Temperature Test Method

4.1.1 Thermocouple method Thermocouples are directly and tightly attached to the outer surface of an insulating structure to measure its surface temperature. This is the basic method for testing the outer surface temperature of an insulating structure. method.

4.1.2 Surface Thermometer Method The surface temperature of a thermocouple, resistance temperature detector (RTD), or other surface temperature gauge is measured by placing its sensor in contact with the outer surface of the insulating structure being tested. The method can be followed according to the provisions of GB/T 17357. This is a commonly used method for field testing.

4.1.3 Infrared radiation thermometer method An infrared radiation thermometer is aimed at the outer surface of the insulating structure to measure its surface temperature. It is suitable for non-contact measurement and measurement of moving objects. Measurement of the body.