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

GB/T 21614-2026

Replacing GB/T 21614-2008

**Dangerous goods - Test method for the heat of combustion of
aerosols**

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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 21614-2008 "Test Method for Heat of Combustion of Hazardous Sprays". Compared with GB/T 21614-2008, Apart from structural adjustments and editorial changes, the main technical changes are as follows:

---The definitions of total heat of combustion Q_g and net heat of combustion Q_n have been revised, and the definition of energy equivalent W has been added (see Chapter 3, 2008 edition). Chapter 3);

---Added reagents or materials, including benzoic acid, oxygen, ignition wire, gelatin capsules, or other sealable containers (see Chapter 6);

---Added calibration of equipment and materials, including calibration of the energy equivalent of the calorimeter and calibration of the heat of combustion of gelatin capsules (see...). Chapter 8);

---The test procedures have been modified, including sample weighing, oxygenation, water

temperature adjustment, the insulating shell method (Test Method 1, Arbitration Method), and the isothermal shell method. (Experimental Method 2), Post-Experimental Inspection (see Chapter 9, Chapter 6 of the.2008 edition);

---Calculations have been modified, including the temperature rise of the adiabatic shell calorimeter, the temperature rise of the isothermal shell calorimeter, and the temperature released after the ignition wire burns. Calculations of heat, heat released upon combustion of gelatin capsules, total heat of combustion, net heat of combustion, and heat of combustion of aerosols (see Chapter 10). Chapter 7 (2008 edition)

---Increased precision (see Chapter 11). 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 Hazardous Chemicals Management (SAC/TC251). This document was drafted by: Shanghai Chemical Industry Research Institute Testing Co., Ltd., Ningbo Customs Technology Center, Nanjing University of Science and Technology, and Shanghang County Safety Production Emergency Management Center. Emergency Rescue Service Center, Zhongshan Tiantu Fine Chemical Co., Ltd., Shanghai Emergency Management Affairs and Chemical Registration Center, Changzhou Huguosi Yuan Product Safety Technology Service Co., Ltd., Shanghai Chemical Industry Research Institute Co., Ltd., Chemical Industry Productivity Promotion Center, Yingde Dongshun Fine Chemicals Co., Ltd. Chemical Industry Co., Ltd., Qiannan Prefecture Emergency Rescue Command Center, Inner Mongolia Chemical Vocational College, and China Petroleum and Chemical Industry Federation. The main drafters of this document are. He Yuan, Wu Hao, Lai Xitang, Xiao Qiuping, Jiang Wei, Chen Youwei, Xu Sen, Hu Xunjun, Liang Gaojian, Wang Yan, Fan Bin, Lin Jian, Liu Wei, Liu Wanqing, Wu Yandong, Gao Wenjun, Liu Yun, Bo Chenqi, Yu Xin, Jiang Xiaohan, Cui Yandong, Zhang Weijing, Rong Xiao, Wu Ke, Cui Zhibo, Wang Qian, Liu Tongling, Wang Fei, and Li Jiping. The release history of this document and the document it replaces is as follows:

---First published in.2008 as GB/T 21614-2008;

---This is the first revision.

Aerosols, also known as sprays or aerosols, are non-refillable containers made of metal, glass, or plastic, containing compressed, liquefied, or... Dissolved gas, with or without liquid, paste, or powder, equipped with a release device that allows the contents to be ejected, forming a suspension in the gas. Solid or liquid particles, the sprayed product is in the form of foam, paste, or powder, or in liquid or gas form. Based on the spraying distance, it is classified as foam aerosol. This document applies only to aerosol sprays and not to foam sprays. In the UN's "Recommendations on the Transport of Dangerous Goods (Model Regulations)" and the UN's "Globally Harmonized System of Classification and Labelling of Chemicals," The classification of flammability of aerosols is related to the content of flammable components and the heat of combustion of the aerosol product. The heat of

combustion of the aerosol contents can be determined by... Obtained by referring to published scientific literature, calculations, or appropriate testing methods. Aerosol contents may possess various hazards, such as toxicity, corrosiveness, and flammability. This document only addresses the flammability of aerosol sprays. The classification provides for the determination of the heat of combustion of solid and liquid components and the calculation of the heat of combustion of aerosols, but the classification of aerosol flammability is not based on... The determination also needs to consider the mass fraction of flammable components in the aerosol and the test requirements specified in GB/T 21630 and GB/T 21631 (where applicable). The results are determined comprehensively. Test method for heat of combustion of hazardous aerosols Warning

---Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

GB/T 21614-2026 is the Chinese national standard covering the heat of combustion of an aerosol product - the figure that decides its transport classification, and therefore whether a can of spray may go by air, by road only, or not at all. It replaces GB/T 21614-2008 and has been in force since 1 May 2026. It was issued on 28 January 2026 and has been in force since 1 May 2026, replacing GB/T 21614-2008. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes the principle, test conditions, reagents or materials, instruments and equipment, calibration of equipment and materials, and test procedures for aerosol combustion heat testing. Requirements for verification procedures, calculations, precision, and reporting. This document applies to the determination of the heat of combustion of solid and liquid components in aerosols, as well as the calculation of the heat of combustion of aerosols.

4.Principles A certain amount of sample is loaded into an oxygen bomb, and the temperature change before and after the test is measured using either the isothermal shell method or the adiabatic shell method. The result is obtained through calculation. The heat of combustion of the sample is determined, and the heat of combustion of the aerosol is calculated based on the mass ratio.

5.Test conditions The ambient temperature should be $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$, and the relative humidity should be 30%~80%. The instruments and equipment should be kept away from direct sunlight.

3.0 MPa ±

0.5 MPa. Warning

---Do not overfill with oxygen. If too much oxygen is added, open the inflation connector to release the gas from the oxygen bomb. If this is done by refilling... The weighing results indicate that the sample in the oxygen bomb has been damaged and should be tested again.

6 Reagents or materials

6.1 Benzoic acid. Certified reference material; should be in tablet or pellet form.

6.2 Oxygen. purity not less than 99%.

6.3 Ignition wire. iron wire or chromium-nickel alloy wire.

6.4 Gelatin capsules or other sealable containers.

7 Instruments and Equipment

7.1 Automated calorimeter. It consists of an oxygen bomb, a calorimeter, a housing, a thermometer, a stirrer and related accessories. The temperature resolution should not be greater than 0.01°C.

7.2 Analytical balance. graduation value is

0.1 mg.

7.3 Ruler. Scale division value is 1mm.

8 Calibration of equipment and materials

8.1 Calibration of the Energy Equivalent of the Calorimeter Weigh 0.9g~1.1g (accurate to 0.1mg) of benzoic acid to calibrate the energy equivalent of the calorimeter, according to Chapter 9. Six tests were conducted, with a total completion time of no less than 3 days and no more than 10 days. The energy equivalent should be recalibrated if any changes are made to the internal components of the calorimeter. The energy equivalent W of the calorimeter is calculated according to formula (1).

8.2 Calibration of the heat of combustion of gelatin capsules Weigh out

0.5 g (accurate to

0.1 mg) of gelatin capsules and perform at least three tests according to Chapter

9. When the gelatin capsule batch is changed... If necessary, recalibration should be performed. The heat of combustion Q_{gel} of gelatin capsules is calculated according to