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

GB/T 20702-2026

Replacing GB/T 20702-2006

**Test method for the extinguishing performance of gaseous
extinguishing agents**

气体灭火剂灭火性能测试方法

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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 20702-2006 "Test Methods for Extinguishing Performance of Gaseous Fire Extinguishing Agents". Compared with GB/T 20702-2006, except for... Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) A test apparatus for the delivery system suitable for testing the extinguishing concentration of high-boiling-point gaseous extinguishing agents has been added (see 4.2.3);
- b) A list of recommended typical fuels has been added (see 4.3);
- c) The air flow rate in the method for determining the extinguishing concentration of gaseous fire extinguishing agents using flammable liquids as fuel was modified [see 4.4.1c], 2006. Version A.4.4];
- d) The test procedure for determining the extinguishing concentration of a gaseous extinguishing agent using flammable liquid as fuel, involving different airflow rates, has been removed (see [link to documentation]). (A.4.10~A.4.19, 2006 edition)
- e) The test procedure involving heating the fuel in the method for determining the extinguishing concentration of a gaseous extinguishing agent using flammable liquid as fuel has been removed. (See A.4.22~A.4.23 in the 2006 edition);
- f) The test steps for different flame heights in the method for determining the extinguishing concentration of gaseous fire extinguishing agents using combustible gas as fuel have been removed (see [link]). (A.5.11, 2006 edition)
- g) Added requirements for relevant test conditions in the "Test Report" of the test method

for the extinguishing concentration of gaseous fire extinguishing agents [see 4.5c)];

h) A test report for the inerting concentration test method of gaseous fire extinguishing agents has been added (see 5.4). 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 National Fire and Rescue Administration. This document is under the jurisdiction of the National Fire Protection Standardization Technical Committee (SAC/TC113). This document was drafted by: Tianjin Fire Research Institute of the Ministry of Emergency Management, Civil Aviation University of China, Shanghai Huiyou Precision Chemicals Co., Ltd., and Zhejiang... Hunan Provincial Chemical Research Institute Co., Ltd., Zhejiang Noah Fluorochemical Co., Ltd., China University of Mining and Technology (Beijing), State Grid Hunan Electric Power Co., Ltd. Disaster Reduction Center. The main drafters of this document are. Zhao Jing, Chen Peiyao, Wang Shuai, Zhuang Shuang, Zhang Beichen, Zhang Xiao, Liu Mingli, Ni Hang, Tao Yang, Zhou Biao, and Chen Baohui. The release history of this document and the document it replaces is as follows:

---This document was first published as GB/T 20702-2006;

---This is the first revision.

Gaseous fire extinguishing agents are widely used for fire protection in electrical equipment, data centers, and cultural relic archives. Extinguishing concentration and inerting concentration are also important considerations. It is a key indicator for evaluating the fire extinguishing performance of gaseous fire extinguishing agents and provides a design basis for the engineering application of gaseous fire extinguishing agents. This document provides a test method for determining the fire extinguishing performance of gaseous fire extinguishing agents under laboratory conditions. This method has applications in scientific research and engineering. Widely used in the formulation of construction standards, the measured extinguishing concentration or inerting concentration reflects the extinguishing effect of the gaseous extinguishing agent under test conditions. The minimum critical value for inerting effect, and the test results, provide important data support for the selection and engineering design of gaseous fire extinguishing agents. In practical engineering applications... In practice, multiple factors such as the configuration of the fire extinguishing system, environmental conditions, and safety level must be considered to ensure continuous and effective protection. Test methods for the extinguishing performance of gaseous fire extinguishing agents Warning

---The testing process may involve chemical exposure, high pressure risk, explosion risk, and fire risk. Personnel should take appropriate safety precautions. Protective measures.

1 Scope

GB/T 20702-2026 is the Chinese national standard covering measuring what concentration

of a gaseous agent puts a fire out - the cup burner test that gives the extinguishing concentration from which every system design concentration is derived. It replaces GB/T 20702-2006 and has been in force since 1 October 2026, with the hanging gas extinguisher standard GB 47485-2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 20702-2006. The document is under the responsibility of the National Fire and Rescue Administration. 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 experimental principle, apparatus, materials, procedures, and test report for determining the extinguishing concentration of gaseous fire extinguishing agents using the cup combustion method. The experimental principle, apparatus, materials, procedures, and test report for determining the inerting concentration of gaseous fire extinguishing agents using the inerting ball method. This document applies to the determination of extinguishing concentration and inerting concentration of gaseous fire extinguishing agents. It can be used as a reference for the determination of the extinguishing performance of other gaseous media.

4 Test method for extinguishing concentration of gaseous fire extinguishing agents

4.1 Experimental Principle At the center of the coaxial airflow, fuel combustion in the cylindrical storage tank (cup) forms a diffused flame, which is gradually added into the air. For gaseous fire extinguishing agents, record the concentration at which the fire was extinguished when it spread.

4.2 Test Apparatus

4.2.1 General Requirements The extinguishing agent concentration testing device is a cup burner. The cup burner should conform to the structure shown in Figure 1, and the combustion cup should conform to the structure shown in Figure 2. Structure. Unless otherwise specified, the dimensional error of the indicated dimensions shall not exceed $\pm 5\%$.

4.2.2 Components The test setup includes the following.

---Combustion cup. Should be cylindrical, open at the top, made of glass, quartz, or stainless steel, with an outer diameter of (30 ± 1) mm and a wall thickness of 1 mm. 2mm; top edge chamfered at 45° , fuel temperature measuring device installed 2mm~5mm below the top; gaseous fuel fire extinguishing The top of the device should be designed to ensure uniform gas flow (e.g., by filling it with refractory material).

---Chimney. Should be a vertical circular pipe, made of glass or quartz, with an inner

diameter of (85 ± 2) mm, a wall thickness of 2 mm~5 mm, and a height of... (535 ± 5) mm.

---Gas collection tube. Air and extinguishing agent are collected in the gas collection tube to form a single mixed flow that is then sent into the diffuser.

---Diffuser. Installed at the bottom of the chimney, it is used to introduce a mixed airflow of air and extinguishing agent, and to ensure that the mixed airflow passes evenly through the chimney. The temperature of the air and extinguishing agent mixture inside the diffuser should be $(25\pm 10)^{\circ}\text{C}$, measured using a calibrated temperature sensor.

---Fuel supply. Liquid fuel shall be delivered to the cup at a constant and adjustable level; gaseous fuel shall be delivered to the cup at a constant flow rate.

---Air supply. A device for supplying air to the air collection pipe. The flow rate is adjustable, and the air flow rate should be measured using a calibrated device.

---Extinguishing agent supply. A device for delivering extinguishing agent to the gas collection pipe. The flow rate is adjustable, and the extinguishing agent flow rate should be measured using a calibrated device.

---Delivery system. A representative and measurable extinguishing agent sample should be delivered to the cup burner in gaseous form.

4.2.3 Delivery system suitable for testing the extinguishing concentration of high-boiling-point gas extinguishing agents Before introducing high-boiling-point gaseous extinguishing agents, the equipment should be adjusted, and a delivery system suitable for high-boiling-point gaseous extinguishing agents should be added to ensure the extinguishing effect. The extinguishing agent is fully vaporized. A schematic diagram of the extinguishing agent delivery system is shown in Figure

3. The design of the delivery system should ensure that the extinguishing agent can vaporize and remain stable. The extinguishing agent should be delivered to the cup burner in a controlled manner, and the temperature should be strictly controlled to avoid high-temperature decomposition of the extinguishing agent or the generation of impurities, which would affect the test results. The components of the conveying system are as follows:

---High-pressure syringe pump. Composed of a motor, transmission system, syringe, and control system, it works in conjunction with a check valve to seal the liquid inlet, forming a closed-loop system. The system ensures that the liquid extinguishing agent is output at a constant flow rate under high pressure.

---Vaporization Furnace. Utilizes a circulating tank heating method to vaporize liquid extinguishing agents. The vaporization furnace should be equipped with precise temperature control to ensure... The extinguishing agent is completely vaporized and the temperature is stable.