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

GB/T 20284-2026

Replacing GB/T 20284-2006

Single burning item test for building materials and products

建筑材料及制品的单体燃烧试验

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1 Scope

GB/T 20284-2026 is the Chinese national standard covering the SBI test - a corner of two walls of the product is exposed to a burner and the heat release and smoke are measured, which is the test that places a building material in the European-style reaction to fire classes China has adopted. It replaces GB/T 20284-2006 and has been in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 20284-2006. 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 a method for determining the reaction-to-fire performance of building materials and products using the Single Burning Item (SBI) test apparatus. This document applies to the determination of the combustion performance of building materials, interior finishing materials, and products used in industrial and civil buildings. It may also be used as a reference for determining the combustion performance of materials and products used in other settings. This document is not applicable to the determination of the burning behavior of floor coverings.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 5907.1, Fire protection vocabulary -- Part

3 Terms and definitions

The terms and definitions defined in GB/T 5907.1, GB/T 5907.2, and GB 8624, as well as the following terms and definitions, apply to this document.

3.1 Backing board Example 2.FIGRA

0.4 MJ represents the maximum value of the ratio of the heat release rate to the time of exposure to fire, once the Total Heat Release (THR) threshold of

0.4 MJ has been reached. NOTE. For detailed descriptions of FIGRA

0.2 MJ and FIGRA

0.4 MJ, see A.4.3.

3.9 smoke growth rate index; SMOGRA The maximum value of the ratio of the specimen's smoke production rate to the duration of fire exposure. NOTE. See A.5.3 for a detailed description of SMOGRA.

3.10 sustained flaming Flaming combustion on or above the surface of the specimen persisting for a period of time.

4 Test apparatus

4.1 Overview The test apparatus comprises a combustion chamber, a trolley, an ignition source, a smoke collection hood, an exhaust duct, measuring instruments within the exhaust duct, a white-light smoke measurement system, and flue gas analysis instruments. A schematic diagram of the test apparatus is shown in Figure 1.

4.3 Trolley The trolley is used to support the specimen (see Figure 1). Once the trolley is positioned within the combustion chamber, its inlet and outlet openings must be sealed, with the exception of the air inlet at the bottom. Perforated plates shall be installed at the front, left, and right sides of the trolley base. These plates shall have hole diameters of 8 mm~12 mm and an open area ratio of 40%~60%. The specimen shall be mounted on the trolley base plate (see 6.5), and the base plate shall be positioned horizontally. NOTE. Using a spirit level is a convenient way to check the level of the cart's base plate. The backing board shall be a calcium silicate board as specified in GB/T 40238, with dimensions as follows:

- a) Backing board for the short wing of the specimen. ($\geq 570 + \text{specimen thickness}$) mm x (1500 $\pm$ 5) mm;
- b) Backing board for the long wing of the specimen. (1,000 + air gap $\pm$ 5) mm x (1500 $\pm$ 5) mm.

4.4 Ignition source The ignition source is a triangular metal burner, see Figure 3a). It shall be positioned in the corner of the U-shaped slot in the trolley base plate, with its top surface (25 $\pm$ 3) mm above the top surface of the U-shaped slot. The ignition source shall be designed to allow gas to flow smoothly and evenly out of the top surface of the burner. Internally, the ignition source shall be arranged from bottom to top with a 10 mm thick air layer, a 50 mm thick packed layer composed of ceramic spheres with diameters of 4 mm~8 mm, and a 20 mm thick packed layer composed of ceramic spheres with diameters of 2 mm~4 mm, see Figure 3b). Figure 3 -- Schematic diagram of ignition sources The gas used for the ignition source shall be propane with a purity of not less than 95%. A mass flow controller shall be used to regulate the propane flow rate. The mass flow controller shall have a measurement range of at least 0 g/s~

2.3 g/s, with a reading accuracy of 1% within the

0.6 g/s~

2.3 g/s range. A remote ignition method shall be used for the ignition source. Safety facilities, such as gas safety valves and emergency stop devices, shall be provided to ensure the safe use of gas.

4.5 Smoke collection hood The smoke collection hood is fixed to the top of the support frame within the combustion chamber. The length of the hood's base shall be no less than 1450 mm, and its width no less than 1255 mm. A collector shall be provided at the top of the hood, and this collector shall be equipped with a connection port for the exhaust duct.

4.6 Smoke exhaust duct The exhaust duct is connected to the collector. The inner diameter (D) of the duct shall be 300 mm~400 mm. The length of the straight duct section shall be no less than 12D.

4.7 Measuring instruments in smoke exhaust ducts

4.7.1 Pressure-measuring probe The pressure difference of the airflow within the smoke exhaust duct shall be measured using a bidirectional pressure probe (see Figure 4) or a hemispherical pressure probe (see Figure 5). The pressure probe shall be installed in a straight section of the smoke exhaust duct at a position along the duct axis no less than 8D from the inlet end of that section. Conduits of equal length shall be used to connect the pressure probe to the pressure sensor. The pressure sensor shall have a measurement range of

0 Pa~200 Pa and an accuracy of $\pm$

4.9 Flue gas analysis instruments

4.9.1 The volume fractions of oxygen and carbon dioxide in the flue gas within the exhaust duct shall be measured using a gas analyzer. Moisture shall be removed using a desiccant before the flue gas sample enters the gas analyzer.

4.9.2 The oxygen analyzer shall be of the paramagnetic type or another gas analyzer with equivalent performance. The measurement range shall be at least 16%~21% (Voxygen / Vair). The resolution of the output value shall not exceed 0.01%.

4.9.3 The carbon dioxide analyzer shall be an infrared (IR) type or another gas analyzer with equivalent performance. The measurement range shall be at least 0%~10%. The resolution of the output value shall not exceed 0.01%. The linearity of the carbon dioxide analyzer shall not exceed $\pm 1\%$ of the full scale.

4.10 Environmental parameter measurement instrument

4.10.1 An instrument for measuring ambient temperature. shall be a Type K thermocouple with a diameter of (2 ± 1) mm that complies with the requirements of GB/T 16839.1. This