

ICS 13.220.20

CCS C 81



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

GB/T 47438.5-2026

**Special requirements for fire alarm and evacuation in
hazardous chemicals workplaces - Part 5: Power, transmission
and control cables**

危险化学品作业场所火灾报警与避难逃生特殊要求 第5部分：供电、传输及控制
线缆

Issued on: April 30, 2026

Implemented on: May 1, 2027

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

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5 Technical Requirements

5.1 General Requirements Cables should first meet the requirements of the relevant national product standards, and at the same time meet the requirements of this chapter.

5.2 Combustion performance The fire resistance of the cable should meet the requirements of Class A or Class B1 in GB 31247-2014.

5.3 Fire resistance

5.3.1 The fire resistance of data cables or optical cables used for transmission and control shall not be lower than Class N specified in GB/T 19666-2019.

5.3.2 The fire resistance of power supply cables shall not be lower than the NJ level specified in GB/T 19666-2019.

5.3.3 The fire resistance performance of power supply cables for fire pumps, fire elevators, and fire control rooms shall meet the requirements specified in GB/T 19666-2019. NS level.

5.4 Environmental tolerance After the severity level tests specified in Table 1 are completed, the fire resistance of the cable should not be lower than the original level requirements.

6.1 General Requirements

6.1.1 Test Atmospheric Conditions Unless otherwise specified in the relevant provisions, all tests shall be conducted under the following atmospheric conditions.

---Temperature. 15°C~35°C;

---Relative humidity. 25%~75%;

---Atmospheric pressure. 86kPa~106kPa.

6.1.2 Tolerance Unless otherwise specified in the relevant clauses, the tolerance for all test data is $\pm 5\%$; deviations in environmental condition parameters shall comply with GB/T 16838. Require.

6.1.3 Sample The test specimens shall be prepared in accordance with the requirements of GB/T 19666-2019 and GB 31247-2014. The test specimens shall be prepared in the same batch or at the same time. One cable is completed and numbered before testing.

6.1.4 Test Procedure The experimental procedure is shown in Table 2.

6.2 Combustion performance test The combustion performance test shall be conducted in accordance with the requirements of Chapter 4 of GB 31247-2014.

6.3 Fire resistance test Fire resistance tests shall be conducted in accordance with the requirements of

6.2 in GB/T 19666-2019.

6.4.1 Test Procedure

6.4.1.1 Place the cable in a test chamber and heat it to $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ at a rate not exceeding 1K/min, maintaining this temperature for 14 days. (14 days) After completion, the test sample should be kept inside the test chamber, and then the temperature should be lowered to within the temperature deviation range of the test standard conditions. During the temperature drop... The time should be sufficient for the temperature to stabilize, and should last at least 1 hour.

6.4.1.2 After the test, the fire resistance of the cable shall not be lower than the original grade requirement.

6.4.2 Test Equipment The high-temperature test chamber shall comply with the provisions of GB/T 16838.

6.5.1 Test Procedure

6.5.1.1 Place the cable in a test chamber, set the chamber temperature to $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$, and the relative humidity to not less than 95%, and repeat the test 6 times. Repeat the following

cycle for 24 hours each time.

- a) The temperature inside the test chamber should be raised to $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ within $3\text{h}\pm 0.5\text{h}$, and the rate of temperature increase should be maintained within the boundary of the shaded area in Figure 1. The relative humidity during this stage should be no less than 95%, and the relative humidity during the last 15 minutes should be no less than 90%.
- b) The temperature should be maintained at the specified high temperature limit $\pm 2^{\circ}\text{C}$ until $12\text{h}\pm 30\text{min}$ from the start of the cycle. This initial and final stage... The relative humidity should be between 90% and 100% for the last 15 minutes, and between $(93\pm 3)\%$ for the rest of the time.
- c) The temperature should be reduced to $25^{\circ}\text{C}\pm 3^{\circ}\text{C}$ within $3\text{h}\sim 6\text{h}$. The cooling rate for the first 1.5h is as shown in Figure 1, and the rate for the next $3\text{h}\pm 15\text{min}$... The internal temperature reaches $25^{\circ}\text{C}\pm 3^{\circ}\text{C}$. Except for the initial 15 minutes when the relative humidity should not be less than 90%, the relative humidity for the remaining time should be... The degree should be no less than 95%.
- d) The temperature should be maintained at $25^{\circ}\text{C}\pm 3^{\circ}\text{C}$, and the relative humidity should not be less than 95% until the cycle ends.

6.5.1.2 After the test, the fire resistance of the cable shall not be lower than the original grade requirement.

6.5.2 Test Equipment Alternating damp heat test chambers shall comply with the provisions of GB/T 16838.

6.6.1 Test Procedure

6.6.1.1 Place the cable in an environment with a sulfur dioxide concentration of $(25\pm 5)\times 10^{-6}$ (volume fraction), a relative humidity of $(75\pm 5)\%$, and a temperature of The corrosion test chamber was set at $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 21 days.

6.6.1.2 After completing the process in 6.6.1.1, place the cable in a test chamber at a temperature of $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and a relative humidity of less than 50% to dry. 16h.

6.6.1.3 After the test, the fire resistance of the cable should not be lower than the original grade requirement.

6.6.2 Test Equipment The sulfur dioxide (SO_2) corrosion test chamber shall comply with the provisions of GB/T 16838.

6.7.1 Test Procedure

6.7.1.1 Place the cable in a salt spray test chamber with a temperature of $15^{\circ}\text{C}\sim 25^{\circ}\text{C}$ and a salt solution mass fraction of $(5\pm 1)\%$, and spray continuously. 2h.

6.7.1.2 After each spraying cycle, transfer the cable to a humidity chamber for storage. The

humidity chamber temperature should be adjusted to $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$, and the relative humidity should be... The value was $(93\pm 3)\%$, and the storage time was 168h.

6.7.1.3 After repeating the combination of steps

6.7.1.2 four times, place the cable in an environment with a temperature of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and a relative humidity of... Store for 72 hours under standard atmospheric conditions with a temperature of 45%~55%.

6.7.1.4 After the test, the fire resistance of the cable shall not be lower than the original grade requirement.

6.7.2 Test Equipment Salt spray test chambers shall comply with the provisions of GB/T 16838.

7 Mark

7.1 Product Marking Cables should have the following requirements information displayed on their products or packaging.

- a) Combustion performance rating;
- b) Fire resistance rating.

7.2 Quality Inspection Marks Cables should have a quality inspection certificate.