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

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**Upholstered furniture -- Assessment of the resistance to
ignition of mattress and sofa -- Part 2: Match flame equivalent
(English Translation)**

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1 Scope

This Part of GB 17927 specifies the method and assessment rules for the test of the resistance to ignition of upholstered furniture by using an ignition source of match flame

equivalent.

This Part is applicable to the test and assessment of the resistance to ignition of upholstered furniture such as mattress and sofa used in public places. The test and assessment of the resistance to ignition of upholstered furniture unit can refer to it for implementation.

2 Terms and definitions

The following terms and definitions apply to this document.

2.1

Progressive smouldering

An exothermic oxidation reaction without flames. After being separated from the ignition source, it will spread by itself, sometimes accompanied by incandescent luminescence.

2.2

Flaming

A gaseous combustion process accompanied by luminescence.

2.3

Afterflame

The continuous flaming of the specimen after the ignition source is removed under the specified test conditions.

2.4

- a) The afterglow characteristics gradually intensify on the specimen, which will endanger the safety if the test is continued; and effective fire extinguishing measures must be taken;
- b) During the test, the upholstered part is almost completely ignited by afterglow;
- c) During the test, the specimen is ignited to the end by afterglow; that is, the upper edge, lower edge, side, or the entire thickness of the specimen;
- d) In the final inspection, in any direction except that closest to the top of the ignition source, outside the range of 100 mm away from the ignition source, any scorching phenomenon other than discoloration appears on the specimen.

However, any smouldering extinguished within 120 s after the ignition source is removed is not counted.

3.2 Flaming ignition

In this Part, the following conditions are regarded as flaming ignition:

- a) The afterflame phenomenon gradually intensifies on the specimen, which will endanger the safety if the test is continued; and effective fire extinguishing measures must be taken;
- b) During the test, the upholstered part is almost completely ignited by afterflame;
- c) During the test, the front end of the combustion flame has reached the lower edge, side or through the entire thickness of the specimen.

However, any flaming extinguished within 120 s after the ignition source is removed is not counted.

4 Principle

Use a match flame equivalent as the ignition source to conduct an ignition test on the upholstered furniture, to determine the resistance to ignition of the whole upholstered part including the fabric, lining and filler of the specimen. However, the test results do not indicate the resistance to ignition of a certain constituent material.

5.1 Test room

The test room can be a room with a volume greater than 20 m³ (containing enough oxygen for the test), or a small space with ventilation facilities. The air flow rate, supplied by the air supply and exhaust system, around the test bench is 0.02 m/s~0.2 m/s. It shall contain enough oxygen and does not interfere with the combustion test.

5.2 Fire extinguishing device

Considering that certain material combinations may produce violent combustion during the test, it is necessary to provide sufficient effective fire extinguishing facilities.

6.1 Timer

The timing range of the timer shall not be less than 1 h, with an accuracy of 1 s.

6.2 Ignition source system

Use butane, which is equivalent to a match flame, as the ignition source. The design of the ignition source can provide the heat equivalent to that of a burning match. The ignition source system includes:

- a) Stainless steel combustion tube: One; the outer diameter is (8.0 ± 0.1) mm; the inner diameter is (6.5 ± 0.1) mm; the length is (200 ± 5) mm;

b) Hose: The length shall be 2.5 m~3 m; the inner diameter shall be (7 ± 1) mm;

it shall be connected to the stainless steel combustion tube;

c) Flow control system: It includes a flowmeter, fine-tuning valve, on-off valve, and pressure-regulating valve; is connected to the butane cylinder. The flow rate calibrated by the flowmeter shall be able to meet the requirement of measuring the flow of butane gas at 25 °C to be (45 ± 2) mL/min. The nominal output pressure provided by the system is 2.8 kPa.

Note 1: A stainless steel combustion tube similar in size to a) can also be used. However, within the 50 mm length of the combustion tube from the nozzle (flame port), the inner and outer diameters must be machined to reach the specified size.

in the groove of the quilting line, or on the button for testing. At the same time, start the timer to start timing. The combustion tube shall be placed in horizontal contact with the specimen. After the combustion tube burns on the specimen for (15 ± 1) s, it is carefully moved away from the test part, to terminate the ignition.

8.3.2 Sofa

Place the combustion tube along the joint between the seat cushion and the backrest of the sofa; or place it in other parts where the sofa is most likely to be ignited, e.g. local depressions such as the inner side of the seam and the pits of the quilting line. And make the distance between the ignition source and the two ends of the specimen or the trace left by the previous test at least 50 mm.

At the same time, start the timer to start timing. After the combustion tube burns on the specimen for (15 ± 1) s, it is carefully moved away from the test part, to terminate the ignition.

8.4 Observation and recording of the combustion process

Observe and record all afterflame or afterglow on the surface and inside of the specimen. Any combustion phenomena such as afterflame or afterglow, which extinguish themselves within 120 s after the combustion tube is removed, need not be recorded.

If after the combustion tube is removed for 120 s and up to 1 h, afterflame or afterglow is observed, it indicates that the specimen has not passed the test of resistance to ignition by a match flame equivalent. The test shall be stopped immediately for fire extinguishing treatment. Record the elapsed time from placing the ignition source to extinguishing the ignited specimen; complete the test report.

If no afterflame or afterglow is found within 1 h, these phenomena shall be recorded. And in other positions that meet the requirements of 8.3.1 or 8.3.2, repeat the above test. If there is still no afterflame or afterglow phenomenon, it shall be recorded; and carry out the final inspection of the specimen.