GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 59.080.30

W 04

GB/T 24346-2009

Textiles - Evaluation for anti-mould activity

纺织品 防霉性能的评价

Issued on: September 30, 2009 **Implemented on: February 01, 2010**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;
Standardization Administration of the People's Republic of China.

Table of Contents

Textiles - Evaluation for anti-mould activity

Warning: Mould growth tests are hazardous to human health. Test operators must undergo microbiology training and comply with general laboratory biosafety requirements.

1 Scope

This Standard specifies the test and evaluation methods for determining the anti-mould activity of textiles using the Petri dish method and the suspension method. This Standard does not involve the safety evaluation of anti-mould products.

This Standard applies to all kinds of fabrics and their products. It applies to fibers, yarns, etc. accordingly.

2 Normative references

The terms in the following documents become the terms of this Standard by reference to this Standard. For dated references, all subsequent amendments (not including errata content) or revisions do not apply to this standard. However, parties to agreements that are based on this Standard are encouraged to study whether the latest versions of these documents can be used. For undated references, the latest edition applies to this Standard.

GB/T 12490-2007, Textiles - Tests for colour fastness - Colour fastness to domestic and commercial laundering

3 Terms and definitions

The following terms and definitions are applicable to this Standard.

3.1

moulds

Fungus with a well-developed mycelium that does not produce fleshy fruiting body structures. The fungal body of mould is composed of hyphae, which can extend and branch indefinitely. The branched hyphae are intertwined with each other to form a mycelium, which can cause mildew when growing on textiles.

Note: Enzymes or other substances secreted by moulds can damage textiles, change their physical and chemical properties and reduce their service life. Moulds and the spores and toxins they produce can also be harmful to human health.

3.2

anti-mould activity

The ability of product to inhibit the germination of mould spores and the growth of mycelium.

3.3

control cabric

The textiles used to verify the growth conditions of test moulds, which are made of the same material as the test samples but without anti-mould finishing. If necessary, 100% cotton fabric without any treatment can also be used as a control cabric after high temperature cooking and distilled water washing.

Note: It has been proven that cotton standard adjacent fabrics used in color fastness tests, after high temperature cooking and distilled water washing, or qualitative filter paper can also be used as a control cabric.

4 Test principle

Inoculate the test sample and the control cabric with mould spores respectively; culture them for a certain period of time under environmental conditions suitable for mould growth; observe the growth of mould on the surface of the test sample. Evaluate the anti-mould activity of textiles based on the degree of mould growth on the surface of the sample, use the control cabric to test the activity of mould spores.

5 Equipment and materials

5.1 Constant temperature and humidity incubator: The temperature can be maintained at 28 ℃ ± 2 ℃, and the relative humidity can be maintained at 90% ± 5%.

5.2 Class-II biological safety cabinet.

5.3 Balance: The sensitivity is 0.001 g.

5.4 Refrigerator: The temperature can be maintained at 2 ℃ ~ 8 ℃.

5.5 Autoclave: The temperature can be maintained at 121 ℃ ± 1 ℃, and the pressure can be maintained at 103 kPa.

5.6 Sprayer: The particle size is less than 50 μm.

5.7 Petri dish: The bottom diameter of the dish is 9 cm.

5.8 Sterilized glassware such as triangular flasks, test tubes, glass rods, and glass beads.

7.2.2 Preparation of mould spore solution

7.2.2.1 Take 10 mL of sterile water (6.5) and pour it into the cultured slant strain (7.2.1); use a sterile inoculation loop to gently scrape the surface of the strain to wash out the spores; pour the washed spore solution into a triangular flask containing glass beads.

7.2.2.2 Shake the triangular flask to mix the spore solution thoroughly and disperse the clumped spores. Filter the spore solution through rapid qualitative filter paper to remove mycelial fragments, agar blocks and spore clusters.

7.2.2.3 Centrifuge the filtered spore solution at 4 000 r/min and remove the supernatant. Use 50 mL of sterile water to wash the precipitate; centrifuge again. Wash the spores three times using this method. Use inorganic salt nutrient solution to dilute the spore solution; determine the spore content using a hemocytometer. The prepared spore solution shall contain 1×10^6 spores/mL ~ 5×10^6 spores/mL. Finally, mix the spore solutions of various moulds in equal volumes. The spore suspension obtained in this way is the spore solution for the test. Other appropriate counting methods such as viable count method may also be used to determine the spore content.

Note: For each test, freshly prepared spore solution, or spore solution stored in a refrigerator at 2 ℃ ~ 8 ℃ for no more than 4 days after preparation, can be used.

8 Test preparation

8.1 Test sample

Select representative test pieces from each sample and cut the samples into circular or square test pieces with a diameter or side length of 3.8 cm ± 0.5 cm, for a total of six pieces. Select an appropriate sterilization method for sterilization, such as high-pressure steam (121 ℃, 103 kPa) sterilization for 15 minutes.

8.2 Control cabric

Prepare the control cabric and sterilize according to the size specified in 8.1.

8.3 Anti-mould activity and washability of test sample

If it is necessary to assess the anti-mould activity and washability of the test sample, wash the test sample (8.1) according to the test condition A1M in GB/T 12490-2007. One cycle is equivalent to five washes (the specific operation of one cycle is as follows: add 10 steel beads to 150 mL of solution; wash at 40 °C for 45 min; take out the test sample and wash it twice in 100 mL of water at 40 °C, each time for 1 min). After reaching the specified number of washes, use water to thoroughly clean the test sample; dry; then, test for anti-mould activity.

9.2.2.1 Inoculation of test sample and control cabric

Spray 1 mL of spore solution evenly on both sides of the test sample and the control cabric. When the mist particles are sprayed onto the test sample surface, no obvious droplets shall be formed. Conduct three parallel tests for each test sample and control cabric.

9.2.2.2 Blank test

Take 1 mL of sterile water instead of the mould spore solution; inoculate it on the surface of a test piece as a blank test sample according to 9.2.2.1. Make three parallel test pieces for each test sample.

Note: If the sample cannot absorb 1 mL of spore solution, just spray the spore solution evenly on the entire surface of the test sample without dripping.

9.2.3 Sample placement

9.2.3.1 Test sample and control cabric

After the test sample and control cabric are slightly dried, hang the sample and control cabric in different test chambers (9.2.1) by hanging. Be careful that parallel samples shall not touch each other when placed.

9.2.3.2 Blank test sample

Place the blank test sample in another test chamber (9.2.1) in a manner consistent with the requirements of 9.2.3.1.

9.2.4 Cultivation

Place the test chamber containing the test sample, control cabric and negative control cabric in a constant temperature and humidity incubator and culture them at 28 ℃ ± 2 ℃ and relative humidity of 90% ± 5% for 28 days.

10 Result evaluation

10.1 Observation of test result

After incubation, take out the test sample, control cabric and blank test sample from the constant temperature and humidity incubator; observe the mould growth on the surface of the test sample directly from the front or side. First observe with the naked eye, and if necessary, check with a microscope (magnification of about 50 times).

10.2 Determination of test validity

When the coverage area of mould on the surface of the control cabric is greater than 60% (i.e., the anti-mould effect reaches level 4) and no mould growth is observed on

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------