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Test method of artificial leather and synthetic leather -

Determination of the potential to phenolic yellowing

人造革合成革试验方法 潜在酚黄变的测定

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Test method of artificial leather and synthetic leather - Determination of the potential to phenolic yellowing

1 Scope

This document describes the test method for the determination of the potential to phenolic yellowing of artificial leather and synthetic leather.

This document applies to the determination of the potential to phenolic yellowing of artificial leather and synthetic leather.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 251, Textiles - Tests for colour fastness - Grey scale for assessing staining

GB/T 29778-2013, Textiles - Tests for colour fastness - Assessment of the potential to phenolic yellowing of materials

GB/T 30435, Electric gravity convection and forced ventilation ovens

QB/T 5160-2017, Test method of artificial leather and synthetic leather - Test method for color measurement

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

phenolic yellowing

A phenomenon where phenolic compounds turn yellow when exposed to nitrogen oxides, resulting in the yellowing of artificial leather and synthetic leather materials.

[Source: GB/T 29778-2013, 3.1, modified]

3.2

potential to phenolic yellowing

Likelihood or capability of phenolic yellowing.

[Source: GB/T 29778-2013, 3.2]

4 Principle

Clamp each sample and the standard control cloth respectively in the test paper containing 2,6-di-tert-butyl-4-nitrophenol; place them between different glass plates and stack together; use polyethylene film without phenolic compounds to wrap it tightly, to form a sandwich composite sample; under the specified pressure, put it in the oven for a certain period of time. Use the gray scale for assessing staining to assess the yellowing grade of the sample, so as to assess the likelihood of phenolic yellowing of the sample.

Note: The phenolic compounds in this document mainly refer to 2,6-di-tert-butyl-4-methylphenol, and the reaction of 2,6-di-tert-butyl-4-methylphenol with nitrogen oxides can generate 2, 6-di-tert-butyl-4-nitrophenol.

5 Sample preparation

5.1 Sample size

Cut out a sample with a length of (100 ± 1) mm and a width of (30 ± 1) mm.

Note: For special samples, the shape and specification of the sample can be determined according to the actual application.

5.2 Number of samples

Select at least one sample each time, or take samples according to the negotiation between relevant parties.

6 Test equipment

6.1 Oven

It shall meet the requirements of GB/T 30435 and be able to keep the test temperature within the range of (50 ± 2) °C.

6.2 Test stand

It consists of a pair of stainless-steel racks and a weight. The mass of the weight is (5.0 ± 0.1) kg, and the bottom size is at least (115 ± 1) mm $\times$ (60 ± 1) mm. The structure is

4 – 1 piece of standard control cloth.

Figure 2 – Schematic diagram of sandwich composite sample

8.3 Fold the glass plates, test papers, samples and standard control cloth; use polyethylene film to seal and wrap it tightly; then, use adhesive tape to fix it, to make a sandwich composite sample.

8.4 Place the sealed sandwich composite sample in the test stand, and add a load of (5.0 ± 0.1) kg. After tightening the screws to fix the position of the pressing plate, remove the load.

8.5 Put the test stand with the sandwich composite sample into the oven; place it at a temperature of (50 ± 2) °C for (16 ± 0.25) h.

8.6 Take out the test stand and the sandwich composite sample from the oven; cool to room temperature.

8.7 Open the sandwich composite sample, take out the samples and the standard control cloth, and complete the evaluation of each sample within 30 min.

9 Test result

9.1 Visually observe in the standard multi-light source color box directly; compare the surface of the standard control cloth and the sample leather with their original samples using the gray scale. There is no need to deduct the background color during the comparison. Use the grade with the closest color difference as the grade of phenolic yellowing. Grade 5 is the smallest, where the phenomenon of phenolic yellowing is the weakest; Grade 1 is the largest, where the phenomenon of phenolic yellowing is the most serious.

9.2 If the phenolic yellowing grade of the standard control cloth is less than or equal to grade 3, the test is valid; otherwise, the entire sandwich composite sample shall be retested. If the test is repeated and the test result of the standard control cloth is still greater than Grade 3, the test paper is considered to be invalid, and a test paper from a different batch shall be used for the test again.

9.3 If the sample shows uneven yellowing or yellow spot, the sample shall be retested.

10 Test report

The test report shall include the following contents:

- a) a reference to this document;
- b) sample source;

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