

ICS 83.140.99

CCS G 47



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

GB/T 47633-2026

**Test method for the thermal ageing properties of dipped cords
and yarns**

浸胶帘线、线绳、纱线热老化性能试验方法

Issued on: May 25, 2026

Implemented on: December 1, 2026

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

Table of Contents

6	General Rules for Testing
6.2	Sampling and Sample Preparation
6.4	Preparation of Rubber Modules
7	Test Procedure
7.1	Thermal aging test
7.2	Mechanical property test
7.2.1	Equilibrate the sample under the conditions given in
7.3	Adhesion performance test
9	Test Report

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Petroleum and Chemical Industry Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Rubber and Rubber Products (SAC/TC35). This document was drafted by: Shenma Industry Co., Ltd., Anhui Huaye Special Materials Co., Ltd., and Haiyang Technology Co., Ltd. Zhejiang Youfu High-Tech Fiber Co., Ltd., Changzhou Chaofeng Adhesive Wire Technology Co., Ltd., Qingdao Haishengtai Materials Co., Ltd., Qingdao Science and Technology University. The main drafters of this document are: Wang Bing, Shi Jie, Ji Zengming, Song Minggen, Yang Jie, Feng Xiaomeng, Wang Lili, Li Mao, Wu Xiaoming, Mao Tairu, and Lü Wenjuan. Fu Hongjun. Heat aging properties of rubber-impregnated cords, ropes, and yarns Test methods

1. Scope This document describes the principles, equipment and tools, test rules, and test procedures for the heat aging performance testing of rubber-impregnated cords, rubber-impregnated ropes, and rubber-impregnated yarns. Procedures, test results, and test reports. This document applies to the mechanical properties and pre- and post-aging characteristics of PVC-impregnated cord, PVC-impregnated rope, and PVC-impregnated yarn samples after accelerated aging with hot air. The retention rate, the adhesive properties of the sample prepared into a rubber module before and after aging, and the

performance retention rate of the sample prepared into a rubber module before and after aging. Measurement.

4.Experimental Principle After aging samples of PVC-impregnated cord, PVC-impregnated rope, and PVC-impregnated yarn in hot air at a certain temperature, their mechanical properties before and after aging were measured. Yes, the adhesive properties of rubber modules prepared from the samples before and after aging can be tested, and the adhesive properties of the samples before and after aging can be calculated. The performance retention rate is used to characterize the thermal aging properties of rubber-impregnated cords, rubber-impregnated ropes, and rubber-impregnated yarns.

5.Equipment and Tools This document uses a thermal aging test chamber for testing, and the following requirements must be met.

- a) It has a steady-state hot air circulation device with an air velocity of 0.5 m/s to
- b) After clamping, the sample is suspended on the rotating disk inside the thermal aging test chamber to avoid the sample interfering with the airflow during the test;
- c) The total volume of the specimen is less than or equal to 10% of the effective volume of the heat aging test chamber, the specimen suspension distance is at least 5mm, and the specimen and... The distance between the inner walls of the heat aging test chamber and the wall should be at least 50mm;
- d) Before placing the sample into the heat aging test chamber, ensure that the temperature inside the chamber is within $\pm 2^{\circ}\text{C}$ of the set temperature.
- e) The air replacement frequency in the thermal aging test chamber is 3 to 10 times per hour;
- f) Copper or copper alloys should not be used in the heating device of the thermal aging test chamber.

6 General Rules for Testing

6.1 Test Environment The test should be conducted under the standard laboratory conditions specified in GB/T 2941.

6.2 Sampling and Sample Preparation

6.2.1 Resin-coated curtain. The surface layer of the resin-coated curtain fabric should be removed, and then the resin-coated curtain should be pulled out from different positions at least 200mm from the edge of the fabric. The wire is prepared into a sample with a length of not less than 500 mm.

6.2.2 Impregnated yarn. The outer 3 layers or more should be removed, and then a sample of not less than 500 mm should be prepared.

6.2.3 Glue-impregnated rope. The outer 3 layers or more should be pulled off, and then a sample of not less than 1200 mm should be cut and prepared.

6.2.4 The specimens should be free from defects such as twisting, untwisting, torsion, and wrinkles. Before the test, the specimens should be sealed in an opaque bag and kept for later use.

6.3 Number of Samples The number of test samples should be no less than 26, of which 12 are used for testing at room temperature and 14 are used for thermal aging testing.

6.4 Preparation of Rubber Modules

6.4.1 The rubber module can be prepared using either heat-aged samples or unaged samples. Specifically, the rubber module prepared using heat-aged samples... The adhesive module should not be subjected to heat aging again; it should be directly tested for adhesion performance after equilibration.

6.4.2 The preparation of rubber modules for testing the adhesive properties of impregnated cords and yarns shall be carried out in accordance with GB/T 2942, with the sample embedded for a length of... The thickness is 10mm, the rubber module size is 10mmx10mmx20mm, and the rubber compound formulation and vulcanization test conditions should meet the requirements of the test sample. The requirements for the species or the test shall be determined through consultation between both parties.

6.4.3 The preparation of rubber modules for the adhesive performance test of impregnated cords shall be carried out in accordance with the provisions of GB/T 31333, including the rubber compound formulation and vulcanization. The test conditions should meet the requirements of the sample type or be determined through consultation between the test parties.

Note. Due to differences in rubber formulations and vulcanization test conditions, the test data are not comparable.

6.5 Test Conditions The heat aging test conditions for rubber-impregnated cords, rubber-impregnated ropes, and rubber-impregnated yarns shall comply with the relevant product standards or the agreement between the testing parties. Conditions typically include test temperature, test time, etc. Common test conditions are listed in Appendix A.

Note. The test data are not comparable due to different thermal aging test conditions.

6.6 Balancing of the Rubber Module After vulcanization, the rubber module should be equilibrated under the conditions specified in

6.1 for no less than 16 hours and no more than 96 hours.

7.1 Thermal aging test

7.1.1 Turn on the aging test chamber and set the test temperature of the aging test chamber.

7.1.2 After the temperature of the heat aging test chamber reaches the set temperature, clamp one end of the sample or rubber module with a clip and hang it in the heat aging chamber. On the rotating tray inside the oven.

7.1.3 Set the thermal aging time and start the test.

7.1.4 After the specified aging time has been reached, remove the specimen from the thermal aging test chamber. The removed specimen should be left to acclimate without stress. Then it cools down.

7.1.5 During the test, the sample and the rubber module should not be subjected to heat aging test in the same test chamber at the same time.

7.2.1 Equilibrate the sample under the conditions given in

6.1 for (24 ± 2) h.

7.2.2 Determine the breaking strength, elongation at break, and elongation at constant load of the specimens before and after aging in accordance with GB/T 32108. performance.

7.3 Adhesion performance test

7.3.1 The bonding performance test of PVC-impregnated cords and PVC-impregnated yarns shall be conducted in accordance with the provisions of GB/T 2942, and the tensile testing machine clamp moving speed shall be [not specified]. It is (100 ± 10) mm/min.

7.3.2 The adhesive performance test of the resin-impregnated cord shall be conducted in accordance with the provisions of GB/T 31333, and the moving speed of the clamps of the tensile testing machine shall be (100 ± 10) mm/min.

8. Experimental Results The performance retention rate of the ethylene-impregnated cord, ethylene-impregnated rope, and ethylene-impregnated yarn samples before and after aging was calculated according to formula (1). The test results were then processed according to... GB/T 8170 stipulates rounding to one decimal place.

9 Test Report

The test report should include at least the following.

- a) The name and number of this document;
- b) Types and specifications of PVC-impregnated cords, ropes, and yarns;