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GB/T 4852-2002

Replacing GB/T 4852-1984

Test method for tack of pressure sensitive adhesive tapes by rolling ball

压敏胶粘带初粘性实验方法（滚球法）

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Foreword

This standard equivalently uses the part 12 “Test for tack by inclined rolling ball” in JIS Z 0237:1991 “Test method for pressure-sensitive adhesive tapes and adhesive sheets” as well as the part 4 of the reference part “Test method of tack by rolling ball”.

The main technical differences between this standard and part 12 of JIS Z 0237:1991 are as follows:

There are only 29 kinds of steel balls for testing in this standard, which is lack of two steel balls which have nominal diameters of 21.431 mm and 24.606 mm as compared with the steel balls as specified in the part 12 of JIS Z 0237:1991. This is because there are no such two sizes of steel balls in the steel ball series for rolling bearings in China.

The main technical differences between this standard and the pre-revised standards are:

(1) ADD the method B: Chute rolling ball method. Therefore, the name of this standard is changed from the “Test method for tack of pressure sensitive adhesive tapes by bevel rolling ball” to the “Test method for tack of pressure sensitive adhesive tapes by rolling ball”.

(2) The angle of the inclined plate in the method A is generally specified as 30°, and in special cases, 20° or 40°. However, the standard before revision does not clearly specify the angle of inclination plate in special cases.

(3) The number of rolling balls in the method A is 33 before the revision and 29 after the revision.

This standard shall, from the date of implementation, replace GB/T 4852-1984.

This standard was proposed by the China Petroleum and Chemical Industry Association.

This standard shall be under the jurisdiction of the National Adhesive Standardization Technical Committee.

The responsible drafting organization of this standard: Shanghai Rubber Products Research Institute.

The main drafter of this standard: Zhang Wengang.

This standard was first published in 1984.

Test method for tack of pressure sensitive adhesive tapes by rolling ball

1 Scope

The standard of this method applies to the test of the tack of pressure sensitive adhesive tapes and those products similar to pressure sensitive adhesive tapes.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 308-1989 Rolling bearing - Steel ball

3 Definition

This standard uses the following definition:

Tack

When the object and the adhesive surface of the pressure-sensitive adhesive tape are in short contact with a slight pressure, the adhesion of the adhesive tape to the object is called tack.

4 Principles

Roll a steel ball over the adhesive surface of the adhesive tape that is placed flat on the inclined surface. According to the maximum size of steel ball which can be adhered by the specified length of adhesive surface, evaluate its tack. Or otherwise roll a steel ball of specified size along the chute, to measure the distance at which it is rolled on the adhesive surface of the adhesive tape on the horizontal plate, thereby evaluating its tack.

5 Test conditions

5.1 Unless otherwise specified, the laboratory temperature is 23 °C ± 2 °C and

7.1.1.1 Inclined plate

The inclined plate is made of a smooth hard flat plate (glass plate, metal plate, wood board, plastic plate, etc.).

7.1.1.2 Rolling-aid section

The rolling-aid section is made of a transparent polyester film which has a length of more than 100 mm a thickness of about 25 μm, which is attached to the test piece at a predetermined position. The length of rolling-aid section is 100 mm.

7.1.1.3 Measurement section

The measurement section is an adhesive surface which has a length of 100 mm from the lower end of the rolling-aid section.

7.1.2 Rolling ball: It shall use the rolling ball of the following specifications:

7.1.2.1 Material: It is made of GCr15 bearing steel. The accuracy of the steel ball's shape tolerance and surface roughness shall be above the grade-40 as specified in GB/T 308.

7.1.2.2 The number of the rolling ball and the corresponding nominal diameter are as shown in Table 1.

Table 1 -- Number of the ball and corresponding nominal diameter, mm

Ball number	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nominal diameter	1.588	2.381	3.175	3.969	4.762	5.556	6.350	7.144	7.938	8.731	9.525	10.319	11.112	11.906	12.700
Ball number	17	18	19	20	21	22	23	24	25	26	28	20	30	32	
Nominal diameter	13.494	14.288	15.081	15.875	16.669	17.462	18.256	19.050	19.844	20.638	22.225	23.019	23.812	25.400	

7.2 Test methods

7.2.1 Use a level to fix the rolling ball device horizontally on the test bench. The inclined surface is taken at a standard angle of 30°, or otherwise 20° or 40° if necessary.

7.2.2 At the lower end of the test piece, respectively use positioning adhesive tape or weight (mass of about 500 g) to fix the test piece to a specified position, allowing the adhesive surface to face upwards. In the rolling-aid section, attach the polyester film to the specified position of the adhesive surface. When applying the polyester film, it shall avoid air bubble inclusion or wrinkling, it shall avoid applying high pressure. When fixing the test piece, pay attention to avoiding it from warping or bulging. If bulging occurs at the edge, it shall use

8 Method B -- Chute rolling ball method

8.1 Test device

8.1.1 The structure of the chute rolling ball device is as shown in Figure 2. The tilt angle is 21°30'.

8.1.2 Rolling ball

8.1.2.1 The material is as specified in 7.1.2.1.

8.1.2.2 The size of the rolling ball is in accordance with 7.1.2.2. Use a steel ball which has a number of 14.

8.2 Test methods

8.2.1 Before the test, according to the method described in 7.2.5, clean the chute and steel ball in the test device. Do not touch them from then on.

8.2.2 Use adhesive tape and so on to fix the test piece on a hard horizontal flat test plate (glass plate, metal plate, wood board, plastic plate, etc.). When fixing the test piece, do not allow the test piece to bulge, wrinkle, or warp. When the edge of test piece is warped or bulged, use another adhesive tape to fix this part on the test plate.

8.2.3 As shown in Figure 2, horizontally fix the chute rolling ball device to the test bench on which the test piece is mounted.

8.2.4 Place the rolling ball at the specified starting position. Operate the lever to roll the ball down. Measure the rolling distance the ball. This distance refers to the length between the end of the chute and the center point of contact between the adhesive surface and the ball when it stops rolling, as shown in Figure 2.

8.3 Test results

The test results are expressed as the arithmetic mean of the rolling distance the ball in the 3 test pieces.

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