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

GB/T 4851-2014

Measurement of static shear adhesion for adhesive types

胶粘带持粘性的试验方法

(English Translation)

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Foreword

This Standard was drafted according to the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 4851-1998 "Test Method for Holding Power of Pressure Sensitive Adhesive Tapes". Compared with GB/T 4851-1998, the main technical differences of this Standard are as follows.

- the Standard name is changed into "Measurement of Static Shear Adhesion for Adhesive Tapes";
- the reference to standard JB/T 7499-1994 "Coated Abrasives - Waterproof Abrasive Paper" is deleted (See Chapter 2 of 1998 Edition);
- the term of "roughness average" is added (See 3.2);
- the types of cleaning agents are changed (See 5.2.2; 4.4.1 of 1998 Edition);
- the cutting method of samples is added (See 5.3.1);
- the requirements for standard test steel panel are changed (See 5.3.2; 4.2 of

1998 Edition);

- the dimensions and mass of rollers are changed (See 5.3.3.1; 4.3.1 and 4.3.3 of

1998 Edition);

- the requirements for test stand are changed (See 5.3.4.1; 4.1 of 1998 Edition);
- the standard test conditions of the laboratory are changed (See 5.4.1; 6.1 of 1998 Edition);
- the standard dimensions of test pieces are changed (See 5.4.2; Chapter 5 of 1998

Edition);

-- the cleaning method for steel panel is changed (See 5.5.2; 7.1 of 1998 Edition);

-- the number of times of rolling and applying is changed (See 5.5.3.1; 7.2 of 1998 Edition);

-- the preparation time of samples and the dwell time before testing are changed (See 5.5.3.1; 7.4 of 1998 Edition);

-- the handling of test results is changed (See 5.6; Chapter 8 of 1998);

-- the measurement of shear adhesion of filament reinforced tape applied to a horizontal standard steel panel is added (See Chapter 8);

-- the measurement of measurement of shear adhesion of filament reinforced tape applied to a horizontal panel covered with NIST SRM 1810A standard fibreboard

Measurement of Static Shear Adhesion for

Adhesive Tapes

1 Scope

This Standard specifies a series of test methods for the determination of the ability of an adhesive tape to remain adhered under a constant load applied parallel to the surfaces of the tape and substrate.

This Standard applies to the measurement of static shear adhesion for adhesive tapes.

2 Normative References

The following documents are essential to the application of this Standard. For dated references, only the dated editions apply to this Standard. For undated references, the latest edition (including all amendments) applies to this Standard.

GB/T 2523-2008 Measuring Method of Surface Roughness and Peak Count for Cold-Rolled Metal Sheet (Strip)

GB/T 3280-2007 Cold Rolled Stainless Steel Plate Sheet and Strip

GB/T 22396 Terminology Relating to Pressure Sensitive Adhesive Products

3 Terms and Definitions

For the purpose of this Standard, the following terms and definitions and those defined by GB/T 22396 apply to this Standard.

3.1 Static shear adhesion

It is the resistance of the pressure sensitive adhesive against shear when forces are exerted parallel to the bonding surface.

3.2 Roughness average

It is the arithmetic average deviations of surface roughness profile, i.e. the arithmetic average of surface roughness profile offset absolute values within the sampled length.

3.3 Test assembly

It is the assembly formed after the adhesive tape to be tested is applied to the test

- diacetone alcohol (4-Hydroxy-4-methyl-2-pentanone), non-residual grade;
- methanol;
- methyl ethyl ketone;
- acetone;
- n-heptane;
- isopropyl alcohol;
- a mixture of n-heptane and a fluorinated hydrocarbon such as refrigerant (suitable when toxicity or flammability restrictions apply).

Solvents shall be of general purpose chemical grade and held in a suitable dispensing system.

5.3.1 Test piece cutter

A test piece cutter shall hold two single edge razor blades in parallel planes a precise distance apart, to form a cutter of exact test piece width; two cutters, 12 mm and 24 mm cutting width, shall be available or appropriate alternatives which will not cause edge damage. The precision of the razor blade separation shall be the nominal width ± 0.1 mm.

5.3.2 Stainless steel panels

These shall be perfectly flat, at least 125 mm long and 50 mm wide and at least 1,1 mm thick, stainless steel (hereinafter referred to as steel panel) type in accordance with the 06Cr19Ni10 quality defined in GB/T 3280-2007, having a bright annealed finish with a surface roughness (GB/T 2523-2008) of $50 \text{ nm} \pm 25 \text{ nm}$.

Panels showing stains, discoloration or many scratches are not acceptable. New panels shall be cleaned prior to use as described in 5.5.2. Between uses the panel test surface shall be protected from scratches and contamination and the panels shall be stored in the conditions described in 5.4.1.

5.3.3.1 A cylindrical steel roller (hereinafter referred to as roller) $85 \text{ mm} \pm 2.5 \text{ mm}$ in

diameter and $45 \text{ mm} \pm 1.5 \text{ mm}$ in width, covered with rubber approximately 6 mm in thickness, having a Shore A durometer hardness of 80 ± 5 . The surface shall be a true cylinder, void of any convex or concave deviations. The mass of the roller shall be $2 \text{ kg} \pm 0.1 \text{ kg}$.

5.5.1 Standard test conditions

Standard test conditions shall be the same as 5.4.1 for test pieces and test samples conditioning.

5.5.2.1 Dispense one of the solvents listed in 5.2.2 on to the panel, wiping it to

dryness with fresh absorbent cleaning material. Repeat for a total of three washes with this solvent.

Final wipe shall be with methyl ethyl ketone or acetone. The panel should be allowed to dry for at least 10 min. Panels not used within 10 h should be recleaned.

In order to obtain consistent results a new panel shall be wiped at least ten times with final solvent before use.

NOTE: Discard plates showing stains, discoloration, or many scratches. Avoid contacting panel surface with fingers. During storage panel should, be protected from