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STANDARD

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JIS K 5600-5-10 : 1999
(ISO/DIS 7784-3.2 : 1997)

**Testing methods for paints—
Part 5 : Mechanical property
of film—
Section 10 : Abrasion resistance
(Reciprocating test panel method)**

ICS 87.040

Descriptors : paints, painting, membranes, mechanical testing, wear resistance, wear tests

Reference number : JIS K 5600-5-10 : 1999 (E)

K 5600-5-10 : 1999 (ISO/DIS 7784-3.2 : 1997)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

JIS K 5400 corresponding to this Standard will be withdrawn and replaced with this Standard in April 2002, at the time of three years passed after establishment of this Standard.

Consequently it is recommended to comply with this Standard.

JIS K 5600 consists of the following parts.

JIS K 5600 Part 1 Section 1 to Section 8 *General rule*
 JIS K 5600 Part 2 Section 1 to Section 7 *Characteristics and stability of paints*
 JIS K 5600 Part 3 Section 1 to Section 6 *Film formability*
 JIS K 5600 Part 4 Section 1 to Section 7 *Visual characteristics of film*
 JIS K 5600 Part 5 Section 1 to Section 11 *Mechanical property of film*
 JIS K 5600 Part 6 Section 1 to Section 3 *Chemical property of film*
 JIS K 5600 Part 7 Section 1 to Section 8 *Long-period performance of film*
 JIS K 5600 Part 8 Section 1 to Section 6 *Evaluation of degradation of paint coatings*

JIS K 5600-5 consists of the following sections under the title of "Testing methods for paints—Part 5 : Mechanical property of film".

JIS K 5600 Part 5 Section 1 *Bend test (cylindrical mandrel)*
 JIS K 5600 Part 5 Section 2 *Cupping test*
 JIS K 5600 Part 5 Section 3 *Falling-weight test*
 JIS K 5600 Part 5 Section 4 *Scratch hardness (Pencil method)*
 JIS K 5600 Part 5 Section 5 *Scratch hardness (Stylus method)*
 JIS K 5600 Part 5 Section 6 *Adhesion test (Cross-cut test)*
 JIS K 5600 Part 5 Section 7 *Adhesion test (Pull-off methods)*
 JIS K 5600 Part 5 Section 8 *Abrasion resistance (Rotating abrasive-paper-covered wheel method)*
 JIS K 5600 Part 5 Section 9 *Abrasion resistance (Rotating abrasive rubber wheel method)*
 JIS K 5600 Part 5 Section 10 *Abrasion resistance (Reciprocating test panel method)*
 JIS K 5600 Part 5 Section 11 *Washability*

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 the original JIS is to be the final authority.

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**Testing methods for paints—
Part 5 : Mechanical property of film—
Section 10 : Abrasion resistance
(Reciprocating test panel method)**

Introduction This Japanese Industrial Standard has been prepared based on ISO/DIS 7784-3.2 : 1997 *Paints and varnishes—Determination of resistance to abrasion—Part 3 : Reciprocating test panel method* without changing the technical contents.

The portions underlined with dots in this Standard are not stated in the original International Standard.

Remarks : This Standard is one of three sections of JIS K 5600-5 dealing with the determination of resistance to abrasion of a dried film of paint, varnish or related product.

JIS K 5600-5-8 ; ISO 7784-1 : *Abrasion resistance (Rotating abrasive-paper-covered wheel method)*

JIS K 5600-5-9 ; ISO 7784-2 : *Abrasion resistance (Rotating abrasive rubber wheel method)*

JIS K 5600-5-10 ; ISO/DIS 7784-3.2 : *Abrasion resistance (Reciprocating test panel method)*

Sections 8 and 10 both specify a method using abrasive paper for determination of the resistance to abrasion. In section 9, a method using abrasive rubber wheels is described. The user of JIS K 5600-5 should note that the methods using abrasive paper (sections 8 and 10) are the preferred methods.

1 Scope This Standard is one of a series of standards that deals with the sampling and testing of paints, varnishes and related products.

It specifies a method of determining the resistance to abrasion of a dried film of paint, varnish or related product by rubbing the film against a strip of abrasive paper attached to a stationary wheel.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect is given to this referred standard, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied. The normative references without the indication of the year of coming into effect apply limiting only to the most recent edition (including the amendment).

JIS K 5600-1-2 *Testing methods for paints—Part 1 : General rule—Section 2 : Sampling of products*

Remarks : ISO 1512 : 1991 *Paints and varnishes—Sampling of products in liquid or paste form* is identical with the said standard.

JIS K 5600-1-3 Testing methods for paints—Part 1 : General rule—Section 3 : Examination and preparation of samples for testing

Remarks : ISO 1513 : 1992 *Paints and varnishes—Examination and preparation of samples for testing* is identical with the said standard.

JIS K 5600-1-4 Testing methods for paints—Part 1 : General rule—Section 4 : Standard panels for testing

Remarks : ISO 1514 : 1993 *Paints and varnishes—Standard panels of testing* is identical with the said standard.

JIS K 5600-1-7 Testing methods for paints—Part 1 : General rule—Section 7 : Determination of film thickness

Remarks : ISO 2808 : 1997 *Paints and varnishes—Determination of film thickness* is equivalent to the said standard.

ISO/DIS 6344-1 Coated abrasives—Grain size analysis—Part 1 : Grain size distribution test

3 Principle A dried paint or varnish film on a test panel is abraded, under specified conditions, by rubbing the panel against a strip of abrasive paper attached to the circumference of a stationary wheel. The wheel is weighted so that the abrasive paper is pressed against the panel with a specified force.

After each complete reciprocating movement (double stroke, DS) of the panel, the wheel is advanced through a small angle to bring an unused portion of the abrasive strip into contact with the test surface. Either the resulting loss in mass of the test panel is measured after a specified number of double strokes, and the loss in mass for one double stroke (mg/DS) and the abrasion resistance (DS/mg) are calculated, or the mean number of double strokes required for wearthrough of the coating (or the topcoat of a multi-coat system) is determined (see clause 10).

4 Required supplementary information For any particular application, the test method specified in this Standard needs to be completed by supplementary information. The items of supplementary information are given in Annex A.

5 Apparatus and materials

5.1 Abrasion tester (see Fig. 1)⁽¹⁾ The tester shall consist of a clamping device or pressure plate for holding the test specimen level and rigid and a (50 ± 0.05) mm diameter wheel, to the outer circumference of which a 12-mm-wide strip of silicon carbide paper is attached. The force between the wheel and the test surface shall be capable of being varied from zero to at least (6.9 ± 0.5) N⁽²⁾.

The abrasive action shall be produced by rubbing a test panel in a reciprocating manner (stroke length 30 mm) against a stationary wheel. Other types of instrument in which the panel and the wheel are moved relative to one another in a reciprocating manner may also be used, providing they give the same results.

After each double stroke, the wheel shall be advanced through a small angle to bring a fresh area of the silicon carbide paper into contact with the test surface before making the next double stroke. The angle of rotation shall be such that, after 400 double strokes, the wheel will have made one complete revolution. On completion of