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Testing methods of plastic films for electrical purposes

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electrical Insulating and Advanced Performance Materials Industrial Association (JEIA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS C 2151**:1990 is replaced with this Standard.

This Standard has been made based on **IEC 60674-2**:1988 *Specification for plastic films for electrical purposes—Part 2 : Methods of test* for the purpose of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Contents

Page

Introduction 1

1 Scope 1

2 Normative references 1

3 General notes on tests 3

4 Thickness 3
4.1 Determination of thickness by micrometer 3
4.2 Determination of gravimetric thickness of a sample 4
4.3 Determination of average gravimetric thickness of a roll 4

5 Density 4

6 Width 4

7 Windability (bias/camber and sag) 4
7.1 Principle 4
7.2 Introduction 4
7.3 Method A 5
7.4 Method B 7

8 Coefficient of friction 9

9 Wetting tension (polyolefine films) 9
9.1 Test principle and introductory remarks 9
9.2 Apparatus 10
9.3 Reagents 10
9.4 Test specimens 11
9.5 Conditioning 11
9.6 Procedure 11
9.7 Evaluation 12
9.8 Report 12

10 Tensile properties 12
10.1 Test specimens 12
10.2 Speed of testing 12
10.3 Result 12

11 Edge tearing resistance 12
11.1 Method A 12
11.2 Method B 13

12 Tear resistance 14

13 Stiffness of film 14

14 Surface resistivity ····· 14
15 Volume resistivity ····· 14
15.1 Method A : Electrode method ····· 14
15.2 Method B : Method for wound capacitor dielectric films or films too thin for Method A ····· 15
16 Dissipation factor and permittivity ····· 16
16.1 Method A ····· 16
16.2 Method B ····· 20
17 Electric strength ····· 21
17.1 A.C. test ····· 21
17.2 D.C. test ····· 21
18 Electrical weak spots ····· 22
18.1 Method A (Testing narrow strips of film in long lengths) ····· 22
18.2 Method B (Testing wide strips of film) ····· 24
18.3 Method C (Testing of film in rolls) ····· 25
18.4 Method D (roller-electrode gap method) ····· 26
19 Resistance to breakdown by surface discharges ····· 27
20 Electrolytic corrosion ····· 27
21 Dimensional change ····· 27
21.1 Test specimens ····· 27
21.2 Procedure ····· 28
21.3 Results ····· 28
22 Dimensional stability under tension with rising temperature ····· 28
22.1 Test specimens ····· 28
22.2 Procedure ····· 28
22.3 Results ····· 29
23 Dimensional stability under pressure with rising temperature ····· 29
23.1 Test equipment and instrument ····· 29
23.2 Test specimens ····· 29
23.3 Procedure ····· 29
23.4 Results ····· 29
24 Resistance to penetration at elevated temperature ····· 30
25 Volatile content (loss of mass on heating) ····· 30
25.1 Test specimens ····· 30
25.2 Procedure ····· 30
25.3 Result ····· 30
26 Thermal endurance ····· 30
27 Burning characteristics ····· 30
27.1 Apparatus ····· 30
27.2 Test specimens ····· 31

27.3 Conditioning ····· 31
27.4 Procedure ····· 31
27.5 Interpretation of results ····· 32

28 Water absorption in a damp atmosphere ····· 33
28.1 Apparatus ····· 33
28.2 Test specimens ····· 33
28.3 Procedure ····· 33
28.4 Results ····· 34

29 Absorption of liquid ····· 34
29.1 Principle ····· 34
29.2 Apparatus ····· 34
29.3 Test specimens ····· 34
29.4 Procedure ····· 34
29.5 Calculations ····· 35
29.6 Result ····· 35

30 Ionic impurities ····· 35

31 Effect of insulating varnishes ····· 35
31.1 Procedure ····· 35
31.2 Results ····· 36

32 Effect of polymerisable resinous compounds in a liquid state ····· 36
32.1 Procedure ····· 36
32.2 Results ····· 36

Annex 1 (informative) Test method of coefficient of friction ····· 37

Annex 2 (informative) Test method of surface resistivity and volume resistivity ····· 41

Annex 3 (informative) Comparison table between JIS and corresponding International Standard ····· 49

Testing methods of plastic films for electrical purposes

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **IEC 60674-2** *Specification for plastic films for electrical purposes—Part 2 : Methods of test* published in 1988, and Amendment 1 (2001) with some modifications of the technical contents. The Amendment to the said International Standard has been edited and integrated into this Standard.

The portions with continuous sidelines or dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with explanations is given in Annex 3 (informative).

1 Scope This Standard specifies testing methods of plastic films to be used for electrical equipment, electronic equipment, wires, general electrical insulation, capacitors, etc.(hereafter referred to as "films").

NOTE : The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between **JIS** and the relevant International Standard are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

IEC 60674-2 : 1988 *Specification for plastic films for electrical purposes—Part 2 : Methods of test* and Amendment 1 (2001) (MOD)

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

JIS C 2107 *Methods of test for pressure-sensitive adhesive tapes for electrical purposes*

NOTE : **IEC 60454-2** : 1994 *Specification for pressure-sensitive adhesive tapes for electrical purposes—Part 2 : Methods of test* is equivalent to the said standard.

JIS C 2110 *Testing methods for electric strength of solid insulating materials*

NOTE : **IEC 60243** : 1967 *Recommended methods of test for electric strength of solid insulating materials at power frequencies* is equivalent to the said

standard.

JIS C 2120 *Testing method of varnished cloths and tapes for electrical insulation*

NOTE : **IEC 60394-2** : 1972 *Varnished fabrics for electrical purposes—Part 2 : Methods of test* is equivalent to the said standard.

JIS K 7112 *Plastics—Methods of determining the density and relative density of non-cellular plastics*

NOTE : **ISO 1183** : 1987 *Plastics—Methods of determining the density and relative density of non-cellular plastics* is equivalent to the said standard.

JIS K 7127 *Plastics—Determination of tensile properties—Part 3 : Test conditions for films and sheets*

NOTE : **ISO 527-3** : 1995 *Plastics—Determination of tensile properties—Part 3 : Test conditions for films and sheets* is identical to the said standard.

JIS K 7128-1 *Plastics—Film and sheeting—Determination of tear resistnance—Part 1 : Trouser tear method*

NOTE : **ISO 6383-1**:*1983 Plastics—Film and sheeting—Determination of tear resistance—Part 1 : Trouser tear method* is identical to the said standard.

JIS K 7128-2 *Plastics—Film and sheeting—Determination of tear resistance—Part 2 : Elmendorf tear method*

NOTE : **ISO 6383-2** : 1983 *Plastics—Film and sheeting—Determination of tear resistance—Part 2 : Elmendorf method* is identical to the said standard.

JIS K 7130 *Plastics—Film and sheeting—Determination of thickness*

NOTE : Clauses **3** (Determination of thickness by mechanical scanning, method A), **4** (Determination of thickness of a sample by gravimetric techniques, method B1) and **5** (Determination of average thickness and yield of a roll, by gravimetric techniques, method B2) of **JIS K 7130** are equivalent to the respective relevant clauses of the following International Standards :

ISO 4591 : 1992 *Plastics—Film and sheeting—Determination of average thickness of sample and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)*

ISO 4593 : 1993 *Plastics—Film and sheeting—Determination of thickness by mechanical scanning*

IEC 60093 : 1980 *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials*

IEC 60212 : 1971 *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60216-1 : 2001 *Electrical insulating materials—Properties of thermal endurance—Part 1 : Ageing procedures and evaluation of test results*

IEC 60216-2 : 1990 *Guide for the determination of thermal endurance properties of electrical insulating materials—Part 2 : Choice of criteria*

IEC 60250 : 1969 *Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths*

IEC 60343 : 1991 *Recommended test methods for determining the relative resistance of insulating materials to breakdown by surface discharges*

IEC 60426 : 1973 *Test methods for determining electrolytic corrosion with insulating materials*

IEC 60589 : 1977 *Methods of test for the determination of ionic impurities in electrical insulating materials by extraction with liquids*

IEC 60648 : 1979 *Method of test for coefficients of friction of plastic film and sheeting for use as electrical insulation*

IEC 60674-3 *Plastic films for electrical purposes—Part 3 : Specifications for individual materials*

ISO 4592 : 1992 *Plastics—Film and sheeting—Determination of length and width*

3 General notes on tests

3.1 Discard at least the first three layers of film from the roll to be tested before removing test specimens.

3.2 Sample rolls shall be exposed for at least 24 h to the standard atmosphere 23 ℃ ± 2 K and (50 ± 5) % r.h. before test specimens are removed for test. Unless otherwise specified, all individual test specimens shall be conditioned for 1 h and tested in the same standard atmosphere.

4 Thickness Thickness shall be measured by any one or more of the methods given below as required by the each sheet in **IEC 60674-3** or individual material standards.

4.1 Determination of thickness by micrometer Determination of thickness by mechanical scanning shall be as follows.

4.1.1 Principle The method is based on method A of **JIS K 7130** using a precision micrometer to measure the thickness of a single sheet test specimen.

4.1.2 Test specimens and measuring points Cut three strips about 100 mm wide across the width of the sample. The test strips shall not contain creases or other defects.