



SLOVENSKI STANDARD
SIST EN 60454-2:2007
01-december-2007

BUXca Yý U.
SIST EN 60454-2:1998

GUa c`Yd]b]lfU_cj]nUY_Y_f] bY'bUa YbY!'&"XY.'DfYg_i ýYj UbY'a YlcXY'f97
*** \$() (! & & \$ \$ + L**

Pressure-sensitive adhesive tapes for electrical purposes - Part 2: Methods of test (IEC 60454-2:2007)

Selbstklebende Bänder für elektrotechnische Anwendungen - Teil 2: Prüfverfahren (IEC 60454-2:2007)

iteh STANDARD PREVIEW
(standards.iteh.ai)

Rubans adhésifs sensibles a la pression a usages électriques - Partie 2: Méthodes d'essai (IEC 60454-2:2007)

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>

Ta slovenski standard je istoveten z: EN 60454-2:2007

ICS:

29.035.20 Ú|æ cã } ã Á { ^ } ã [|æ ã \ ã Plastics and rubber insulating materials

SIST EN 60454-2:2007

en,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60454-2:2007

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>

English version

**Pressure-sensitive adhesive tapes for electrical purposes -
Part 2: Methods of test
(IEC 60454-2:2007)**

Rubans adhésifs sensibles
à la pression à usages électriques -
Partie 2: Méthodes d'essai
(CEI 60454-2:2007)

Selbstklebende Bänder
für elektrotechnische Anwendungen -
Teil 2: Prüfverfahren
(IEC 60454-2:2007)

This European Standard was approved by CENELEC on 2007-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 15/377/FDIS, future edition 3 of IEC 60454-2, prepared by IEC TC 15, Solid electrical insulating materials, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60454-2 on 2007-09-01.

This European Standard supersedes EN 60454-2:1995.

This revision includes improved text regarding the flame test (Clause 20), improved text on adhesion (Clause 11) and new Figures 9a and 9b.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2008-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60454-2:2007 was approved by CENELEC as a European Standard without any modification. (standards.iteh.ai)

SIST EN 60454-2:2007

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
-	-	Self-adhesive tapes - Determination of peel adhesion properties	EN 1939	2003
IEC 60216-1	2001	Electrical insulating materials - Properties of thermal endurance - Part 1: Ageing procedures and evaluation of test results	EN 60216-1	2001
IEC 60216-2	2005	Electrical insulating materials - Thermal endurance properties - Part 2: Determination of thermal endurance properties of electrical insulating materials - Choice of test criteria	EN 60216-2	2005
IEC 60216-3	2006	Electrical insulating materials - Thermal endurance properties - Part 3: Instructions for calculating thermal endurance characteristics	EN 60216-3	2006
IEC 60243-1	1998	Electrical strength of insulating materials - Test methods - Part 1: Tests at power frequencies	EN 60243-1	1998
IEC 60426	2007	Electrical insulating materials - Determination of electrolytic corrosion caused by insulating materials - Test methods	EN 60426	2007
IEC 60454-3	Series	Pressure-sensitive adhesive tapes for electrical purposes - Part 3: Specifications for individual materials	EN 60454-3	Series
IEC 60589	1977	Methods of test for the determination of ionic impurities in electrical insulating materials by extraction with liquids	HD 381 S1	1979
ISO 383	1976	Laboratory glassware - Interchangeable conical ground joints	-	-
ISO 527-3	1995	Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets	EN ISO 527-3	1995
ISO 2194	1991	Industrial screens - Woven wire cloth, perforated plate and electroformed sheet - Designation and nominal sizes of openings	-	-
ISO 3071	2005	Textiles - Determination of pH of aqueous extract	EN ISO 3071	2006

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 3599	1976	Vernier callipers reading to 0,1 and 0,05 mm	-	-
ISO 10093	1998	Plastics - Fire tests - Standard ignition sources	EN ISO 10093	1998

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 60454-2:2007

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>

INTERNATIONAL STANDARD

IEC
60454-2

Third edition
2007-06

Pressure-sensitive adhesive tapes for electrical purposes –

Part 2: Methods of test

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60454-2:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

X

For price, see current catalogue

CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Conditioning and specimen preparation.....	8
4 Determination of thickness	8
4.1 Test apparatus	8
4.2 Test specimens	8
4.3 Procedure	8
4.4 Results.....	8
5 Determination of width.....	8
5.1 Method A.....	8
5.2 Method B.....	9
5.3 Method C	9
6 Determination of roll length.....	10
6.1 Principle	10
6.2 Method A – Measurement of turns method	10
6.3 Method B – Length sensor method	11
7 Corrosion-related properties.....	11
7.1 General.....	11
7.2 Preparation of water extract for pH and conductivity determinations	11
7.3 Determination of pH value of water extract	12
7.4 Determination of conductivity of water extract	12
7.5 Detection of corrosive sulfur	13
7.6 Insulation resistance method	14
7.7 Visual method	14
7.8 Wire tensile strength method	14
8 Tensile strength and elongation at break	15
8.1 Apparatus.....	15
8.2 Test specimens	15
8.3 Procedure	15
8.4 Results.....	15
9 Low-temperature properties.....	15
9.1 Principle	15
9.2 Test specimen.....	16
9.3 Procedure	16
9.4 Flexibility.....	16
9.5 Electric strength	16
9.6 Results.....	16
10 Resistance to penetration at elevated temperatures	17
10.1 Apparatus.....	17
10.2 Test specimens	17
10.3 Procedure	17
10.4 Results.....	17
11 Adhesion	17

11.1	Principle	17
11.2	Materials	18
11.3	Apparatus	18
11.4	Test samples and test pieces	19
11.5	Procedure	20
11.6	Expression of results	20
12	Adhesion to backing at low temperatures	21
12.1	Test specimens	21
12.2	Procedure	21
12.3	Results	21
13	Shear adhesion to backing after liquid immersion	21
13.1	Apparatus	21
13.2	Test specimens	21
13.3	Procedure	22
13.4	Results	22
14	Curing properties of thermosetting adhesive tapes	22
14.1	Bond separation during thermal treatment (adhesive to backing)	22
14.2	Bond separation after thermal treatment (adhesion to backing)	22
15	Flagging tests	23
15.1	Principle	23
15.2	Apparatus	23
15.3	Test specimens	23
15.4	Preparation of specimens for test	24
15.5	Test conditions	24
15.6	Results	24
16	Water vapor permeability	24
16.1	Apparatus	24
16.2	Test specimens	24
16.3	Procedure	25
16.4	Results	25
17	Electric strength	25
17.1	General	25
17.2	Test specimens	25
17.3	Procedure	25
17.4	Results	25
18	Electric strength after humid conditioning	26
19	Resistance to flame propagation	26
19.1	Principle	26
19.2	Apparatus	26
19.3	Test specimen	26
19.4	Procedure	27
19.5	Results	27
20	Flame test	27
20.1	Principle	27
20.2	Apparatus	28
20.3	Preparation of test specimen	28
20.4	Procedure	29
20.5	Results	29

iTech STANDARD PREVIEW

(standards.iteh.ai)

SIST EN 60454-2:2007

[https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-](https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007)[465f20e1cb17/sist-en-60454-2-2007](https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007)

21 Thermal endurance	29
21.1 Determination of thermal endurance (based on IEC 60216-1 and IEC 60216-2).....	29
21.2 Voltage breakdown.....	30
21.3 Loss of mass	31
 Annex A (normative) Rollers to be used in various tests.....	 40
 Bibliography.....	 41
 Figure 1 – Measuring device for determination of roll length of tape (measurement of turns method)	 32
Figure 2 – Measuring device for determination of roll length of tape (length sensor method)	32
Figure 3 – Sequence of bends	33
Figure 4 – Dielectric strength test in water	33
Figure 5 – Sketch of penetration tester	34
Figure 6 – Steel test plate	35
Figure 7 – Arrangement for stripping the tape from the plate.....	35
Figure 8 – Flagging test – Preparation of test specimen.....	36
Figure 9a – Draught protection device	37
Figure 9b – Use of Bunsen burner and sliding plate with draught protection device.....	37
Figure 9 – Flame test enclosures	37
Figure 10 – Essential dimensions for flame test (proportions exaggerated for clarity of details)	38
Figure 11 – Dimensions of wedge	39
 Table 1 – Conditioning for low temperature properties	 16

STANDARD PREVIEW

(standard.iteh.ai)

SIST EN 60454-2:2007

[https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-](https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007)

[465f20e1cb17/sist-en-60454-2-2007](https://standards.iteh.ai/catalog/standards/sist/e8bec0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PRESSURE-SENSITIVE ADHESIVE TAPES
FOR ELECTRICAL PURPOSES –**

Part 2: Methods of test

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60454-2 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

This third edition cancels and replaces the second edition published in 1994, and constitutes a technical revision. This revision includes improved text regarding the flame test (Clause 20), the improved text on adhesion (Clause 11) and a new Figures 9a and 9b.

The text of this standard is based on the following documents:

FDIS	Report on voting
15/377/FDIS	15/387/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60454 series, under the general title *Pressure-sensitive adhesive tapes for electrical purposes*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 60454-2:2007

<https://standards.iteh.ai/catalog/standards/sist/e8bee0e7-2dd1-4dea-8681-465f20e1cb17/sist-en-60454-2-2007>

PRESSURE-SENSITIVE ADHESIVE TAPES FOR ELECTRICAL PURPOSES –

Part 2: Methods of test

1 Scope

This part of IEC 60454 specifies methods of test for pressure-sensitive adhesive tapes for electrical purposes.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

IEC 60216-2:2005, *Electrical insulating materials – Thermal endurance properties – Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria*

IEC 60216-3:2006, *Electrical insulating materials – Thermal endurance properties – Part 3: Instructions for calculating thermal endurance characteristics*

IEC 60243-1:1998, *Electrical strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60426:2007, *Test methods for determining electrolytic corrosion with insulating materials*

IEC 60454-3 (all parts), *Pressure-sensitive adhesive tapes for electrical purposes – Part 3: Specifications for individual materials*

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

ISO 383: 1976, *Laboratory glassware – Interchangeable conical ground joints*

ISO 527-3:1995, *Plastics – Determination of tensile properties – Part 3: Test conditions for films and sheets*

ISO 2194:1991, *Industrial screens – Woven wire cloth, perforated plate and electroformed sheet – Designation and nominal sizes of openings*

ISO 3071:2005, *Textiles – Determination of pH of the aqueous extract*

ISO 3599:1976, *Vernier callipers reading to 0,1 and 0,05 mm*

ISO 10093:1998, *Plastics – Fire tests – Standard ignition sources*

EN 1939:2003, *Self-adhesive tapes – Determination of peel adhesion properties* (The peel adhesion test method of Clause 11 is based on test method A of EN 1939:2003. This standard is the result of the harmonisation of AFERA 5001 and PSTC-1,2,3 and 4, ASTM 3330/D, ASTM 3330/M and agreed by JATMA.)

NOTE EN: European Norm (Europe) – AFERA: Association des fabricants européens de rubans auto-adhésifs – PSTC: Pressure sensitive tape council (USA) – ASTM: American society for testing and materials (USA) – JATMA: Japanese adhesive tapes manufacturers association.