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Fasta isolermaterial – Flexibel isolerslang för elektriska ändamål – Del 2: Provningsmetoder

*Flexible insulating sleeving –
Part 2: Methods of test*

Som svensk standard gäller europastandarden EN 60684-2:2011. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60684-2:2011.

Nationellt förord

Europastandarden EN 60684-2:2011

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60684-2, Third edition, 2011 - Flexible insulating sleeving - Part 2: Methods of test**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60684-2, utgåva 1, 1998, SS-EN 60684-2/A1, utgåva 1, 2003 och SS-EN 60684-2/A2, utgåva 1, 2006, gäller ej fr o m 2014-09-14.

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English version

**Flexible insulating sleeving -
Part 2: Methods of test
(IEC 60684-2:2011)**

Gaines isolantes souples -
Partie 2: Méthodes d'essai
(CEI 60684-2:2011)

Isolierschläuche – Teil 2: Prüfverfahren
(IEC 60684-2:2011)

This European Standard was approved by CENELEC on 2011-09-14. 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.

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CENELEC

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

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Foreword

The text of document 15/634/FDIS, future edition 3 of IEC 60684-2, prepared by IEC TC 15, Solid electrical insulating materials, was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60684-2:2011.

This document supersedes EN 60684-2:1997 + A1:2003 + A2:2005.

The main changes from EN 60684-2:1997 + A1:2003 + A2:2005 are as follows: three additional methods for circumferential extension, voltage proof and thermal shock and alignment with North American methods.

The following dates are fixed:

- latest date by which the document has to be implemented at (dop) 2012-06-14
national level by publication of an identical national
standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2014-09-14
document have to be withdrawn

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Endorsement notice

The text of the International Standard IEC 60684-2:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- | | |
|-------------------------|---|
| [2] IEC 60068-2 series | NOTE Harmonized in EN 60068-2 series (not modified). |
| [3] IEC 60068-2-10:2005 | NOTE Harmonized as EN 60068-2-10:2005 (not modified). |
| [4] IEC 60216-2:2005 | NOTE Harmonized as EN 60216-2:2005 (not modified). |

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>
IEC 60068-2-20	2008	Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN 60068-2-20	2008
IEC 60093	1980	Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials	HD 429 S1 ¹⁾	1983
IEC 60212	2010	Standard conditions for use prior to and during the testing of solid electrical insulating materials	EN 60212	2011
IEC 60216	Series	Electrical insulating materials - Thermal endurance properties	EN 60216	Series
IEC 60216-4-1	2006	Electrical insulating materials - Thermal endurance properties - Part 4-1: Ageing ovens - Single-chamber ovens	EN 60216-4-1	2006
IEC 60216-4-2	2000	Electrical insulating materials - Thermal endurance properties - Part 4-2: Ageing ovens - Precision ovens for use up to 300 °C	EN 60216-4-2	2000
IEC 60243-1	1998	Electrical strength of insulating materials - Test methods - Part 1: Tests at power frequencies	EN 60243-1	1998
IEC 60250 ²⁾	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 60426	2007	Electrical insulating materials - Determination of electrolytic corrosion caused by insulating materials - Test methods	EN 60426	2007
IEC 60587	2007	Electrical insulating materials used under severe ambient conditions - Test methods for evaluating resistance to tracking and erosion	EN 60587	2007
IEC 60589	1977	Methods of test for the determination of ionic impurities in electrical insulating materials by extraction with liquids	HD 381 S1	1979

¹⁾ HD 429 S1 is superseded by EN 62631-1:2011, which is based on IEC 62631-1:2011.

²⁾ IEC 60250 is superseded by IEC 62631-1:2011.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60684-3	Series	Flexible insulating sleeving - Part 3: Specification for individual types of sleeving	EN 60684-3	Series
IEC 60695-6-30	1996	Fire hazard testing - Part 6: Guidance and test methods on the assessment of obscuration hazard of vision caused by smoke opacity from electrotechnical products involved in fires - Section 30: Small-scale static method - Determination of smoke opacity - Description of the apparatus	-	-
IEC/TS 60695-11-21 -		Fire hazard testing - Part 11-21: Test flames - 500 W vertical flame test method for tubular polymeric materials	-	-
IEC 60754-1	1994	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the amount of halogen acid gas	-	-
IEC 60754-2 (mod)	1991	Test on gases evolved during combustion of electric cables - Part 2: Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	HD 602 S1 ³⁾	1992
ISO 5-1	2009	Photography and graphic technology - Density- measurements - Part 1: Geometry and functional notation		-
ISO 5-2	2009	Photography and graphic technology - Density- measurements - Part 2: Geometric conditions for transmittance density		-
ISO 5-3	2009	Photography and graphic technology - Density- measurements - Part 3: Spectral conditions		-
ISO 5-4	2009	Photography and graphic technology - Density- measurements - Part 4: Geometric conditions for reflection density		-
ISO 37	2005	Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties	-	-
ISO 62	2008	Plastics - Determination of water absorption	EN ISO 62	2008
ISO 105-A02	-	Textiles - Tests for colour fastness - Part A02: Grey scale for assessing change in colour	-	-
ISO 105-B01	-	Textiles - Tests for colour fastness - Part B01: Colour fastness to light: Daylight	EN ISO 105-B01	-

³⁾ HD 602 S1 is superseded by EN 50267-1:1998 and EN 50267-2-3:1998.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 182-1	1990	Plastics - Determination of the tendency of compounds and products based on vinyl homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperature - Part 1: Congo red method	-	-
ISO 182-2	1990	Plastics - Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperature - Part 2: pH method	EN ISO 182-2	1999
ISO 974	2000	Plastics - Determination of the brittleness temperature by impact	-	-
ISO 1431-1	2004	Rubber, vulcanized or thermoplastic - Resistance to ozone cracking - Part 1: Static and dynamic strain testing	-	-
ISO 4589-2	1996	Plastics - Determination of burning behaviour by oxygen index - Part 2: Ambient-temperature test	EN ISO 4589-2	1999
ISO 4589-3	1996	Plastics - Determination of burning behaviour by oxygen index - Part 3: Elevated-temperature test	EN ISO 4589-3	1996
ISO 13943	2008	Fire safety - Vocabulary	EN ISO 13943	2010

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INTRODUCTION

This International Standard is one of a series which deals with flexible insulating sleeving. The series consists of three parts:

Part 1: Definitions and general requirements (IEC 60684-1)

Part 2: Methods of test (IEC 60684-2)

Part 3: Specifications for individual types of sleeving (IEC 60684-3)

FLEXIBLE INSULATING SLEEVING –

Part 2: Methods of test

1 General

1.1 Scope

This part of IEC 60684 gives methods of test for flexible insulating sleeving, including heat-shrinkable sleeving, intended primarily for insulating electrical conductors and connections of electrical apparatus, although they may be used for other purposes.

The tests specified are designed to control the quality of the sleeving but it is recognized that they do not completely establish the suitability of sleeving for impregnation or encapsulation processes or for other specialized applications. Where necessary, the test methods in this part will need to be supplemented by appropriate impregnation or compatibility tests to suit the individual circumstances.

1.2 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 60068-2-20:2008, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

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

IEC 60212:2010, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60216 (all parts), *Electrical insulating materials – Thermal endurance properties*

IEC 60216-4-1:2006, *Electrical insulating materials – Thermal endurance properties – Part 4-1: Ageing ovens – Single-chamber ovens*

IEC 60216-4-2:2000, *Electrical insulating materials – Thermal endurance properties – Part 4-2: Ageing ovens – Precision ovens for use up to 300 °C*

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

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 60426:2007, *Electrical insulating materials – Determination of electrolytic corrosion caused by insulating materials – Test methods*

IEC 60587:2007, *Electrical insulating materials used under severe ambient conditions – Test methods for evaluating resistance to tracking and erosion*

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

IEC 60684-3 (all parts), *Flexible insulating sleeving – Part 3: Specifications for individual types of sleeving*

IEC 60695-6-30:1996, *Fire hazard testing – Part 6: Guidance and test methods on the assessment of obscuration hazards of vision caused by smoke opacity from electrotechnical products involved in fires – Section 30: Small scale static method – Determination of smoke opacity – Description of the apparatus*

IEC/TS 60695-11-21, *Fire hazard testing - Part 11-21: Test flames - 500 W vertical flame test method for tubular polymeric materials*

IEC 60754-1:1994, *Tests on gases evolved during combustion of materials from cables – Part 1: Determination of the amount of halogen acid gas*

IEC 60754-2:1991, *Test on gases evolved during combustion of electric cables – Part 2: Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity*
Amendment 1 (1997)

ISO 5-1:2009, *Photography and graphic technology – Density measurements – Part 1: Geometry and functional notation*

ISO 5-2:2009, *Photography and graphic technology – Density measurements – Part 2: Geometric conditions for transmittance density*

ISO 5-3:2009, *Photography and graphic technology – Density measurements – Part 3: Spectral conditions*

ISO 5-4:2009, *Photography and graphic technology – Density measurements – Part 4: Geometric conditions for reflection density*

ISO 37:2005, *Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties*

ISO 62:2008, *Plastics – Determination of water absorption*

ISO 105-A02, *Textiles – Tests for colour fastness – Part A02: Grey scale for assessing change in colour*

ISO 105-B01, *Textiles – Tests for colour fastness – Part B01: Colour fastness to light: Daylight*

ISO 182-1:1990, *Plastics – Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperature – Part 1: Congo red method*

ISO 182-2:1990, *Plastics – Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperature – Part 2: pH method*

ISO 974:2000, *Plastics – Determination of the brittleness temperature by impact*

ISO 1431-1:2004, *Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1: Static and dynamic strain test*

ISO 13943: 2008, *Fire safety – Vocabulary*

ISO 4589-2:1996, *Plastics – Determination of burning behaviour by oxygen index – Part 2: Ambient-temperature test*

ISO 4589-3:1996, *Plastics – Determination of burning behaviour by oxygen index – Part 3: Elevated-temperature test*