BS EN 60626-1:2012

BSI Standards Publication

Combined flexible materials for electrical insulation

Part 1: Definitions and general requirements

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National foreword

This British Standard is the UK implementation of EN 60626-1:2012. It is identical to IEC 60626-1:2009. It supersedes BS EN 60626-1:1996, which will be withdrawn on 23 March 2015.

The UK participation in its preparation was entrusted to Technical Committee GEL/15, Solid electrical insulating materials.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EN 60626-1

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English version

Combined flexible materials for electrical insulation - Part 1: Definitions and general requirements
(IEC 60626-1:2009)

Matériaux combinés souples destinés à l'isolement électrique - Partie 1: Définitions et exigences générales
(CEI 60626-1:2009)

Flexible Mehrschichtisolierstoffe zur elektrischen Isolierung - Teil 1: Definitionen und allgemeine Anforderungen
(IEC 60626-1:2009)

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

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

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Foreword

The text of document 15/469/CDV, future edition 3 of IEC 60626-1, prepared by IEC/TC 15 "Solid electrical insulating materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60626-1:2012.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-12-23
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-03-23

This document supersedes EN 60626-1:1995 + A1:1996.

EN 60626-1:2012 includes the following significant technical changes with respect to EN 60626-1:1995:

The Scope was revised specifying treatment of mica paper, and Table 1 was revised cancelling materials no longer in use and introducing newer materials.

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The text of the International Standard IEC 60626-1:2009 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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.

Publication	Year	Title	EN/HD	Year
IEC 60554-3-1	1979	Specification for cellulosic papers for electrical purposes - Part 3: Specifications for individual materials - Sheet 1: General purpose electrical paper	-	-
IEC 60626-3	2008	Combined flexible materials for electrical insulation - Part 3: Specifications for individual materials	EN 60626-3 + corr. October	2008 2008
IEC 60641-3-2	2007	Pressboard and presspaper for electrical purposes - Part 3: Specifications for individual materials - Sheet 2: Requirements for presspaper, types P.2.1, P.4.1, P.4.2, P.4.3 and P.6.1	EN 60641-3-2	2008
IEC 60674-3-2	1992	Specification for plastic films for electrical purposes - Part 3: Specifications for individual materials - Sheet 2: Requirements for balanced biaxially oriented polyethylene terephthalate (PET) films used for electrical insulation	EN 60674-3-2	1998
IEC 60674-3-4 to 6	1993	Specification for plastic films for electrical purposes - Part 3: Specifications for individual materials - Sheets 4 to 6: Requirements for polyimide films used for electrical insulation	EN 60674-3-4 to 6	1995
IEC 60674-3-8	-	Plastic films for electrical purposes - Part 3: Specifications for individual materials - Sheet 8: Balanced biaxially oriented polyethylene naphthalate (PEN) films used for electrical insulation	EN 60674-3-8	-
IEC 60819-3-1	2001	Non-cellulosic papers for electrical purposes - Part 3: Specifications for individual materials - Sheet 1: Filled glass paper	EN 60819-3-1	2001
IEC 60819-3-2	2001	Non-cellulosic papers for electrical purposes - Part 3: Specifications for individual materials - Sheet 2: Hybrid inorganic-organic paper	EN 60819-3-2	2001
IEC 60819-3-3 + corr. February	2006 2008	Non-cellulosic papers for electrical purposes - Part 3: Specifications for individual materials - Sheet 3: Unfilled aramid (aromatic polyamide) papers	EN 60819-3-3[1)]	2006

[1)] EN 60819-3-3 is superseded by EN 60819-3-3:2011, which is based on IEC 60819-3-3:2011.

Publication	Year	Title	EN/HD	Year
IEC 60819-3-4	2001	Non-cellulosic papers for electrical purposes - Part 3: Specifications for individual materials - Sheet 4: Aramid fibre paper containing not more than 50 % of mica particles	EN 60819-3-4	2001

INTRODUCTION

This International standard is one of a series which deals with combined flexible materials consisting of two or more different insulating materials laminated together. The components of the combined materials are plastic films and/or fibrous materials such as papers, woven or non-woven fabrics, impregnated or not impregnated.

This series consist of three parts describing:

Part 1: Definitions and general requirements (IEC 60626-1)

Part 2: Methods of test (IEC 60626-2)

Part 3: Specifications for individual materials (IEC 60626-3)

COMBINED FLEXIBLE MATERIALS FOR ELECTRICAL INSULATION –

Part 1: Definitions and general requirements

1 Scope

This part of IEC 60626 contains the definitions related to and the general requirements to be fulfilled by combined flexible materials for electrical insulation. This standard does not include mica paper, as primary component, covered by IEC 60371, but mica paper may be used as complementary material.

Materials which conform to this specification meet established levels of performance. However, the selection of material by a user for a specific application should be based on the actual requirements necessary for adequate performance in that application and not based on this specification alone.

SAFETY WARNING

It is the responsibility of the user of the methods contained or referred to in this document to ensure that they are used in a safe manner.

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.

NOTE The list of normative references is extensive because, in order to obtain a combination of two or more materials for electrical insulation, it is necessary that those base materials (paper, film, etc) shall conform to the requirements set forth, in the appropriate specification of the base material alone, for that purpose. This rule shall be applied also in the development of new possible combinations; to this end, specifications of materials not actually used, but referenced, may be eligible for future developments.

IEC 60554-3-1:1979, *Specification for cellulosic papers for electrical purposes – Part 3: Specifications for individual materials – Sheet 1: General purpose electrical paper*

IEC 60626-3:2008, *Combined flexible materials for electrical insulation – Part 3: Specifications for individual materials*

IEC 60641-3-2:2007, *Pressboard and presspaper for electrical purposes – Part 3: Specifications for individual materials – Sheet 2: Requirements for presspaper, types P.2.1, P.4.1, P.4.2, P.4.3 and P.6.1*

IEC 60674-3-2:1992, *Specification for plastic films for electrical purposes – Part 3: Specifications for individual materials – Sheet 2: Requirements for balanced biaxially oriented polyethylene terephthalate (PET) films used for electrical insulation*

IEC 60674-3-4:1993, *Specification for plastic films for electrical purposes – Part 3: Specifications for individual materials – Sheet 4: Requirements for polyimide (PI) films used for electrical insulation*

IEC 60674-3-8:—, *Specification for plastic films for electrical purposes – Part 3: Specifications for individual materials – Sheet 8: Requirements for balanced biaxially oriented polyethylene naphthalate (PEN) films used for electrical insulation* [1]

IEC 60819-3-1:2001, *Non-cellulosic papers for electrical purposes – Part 3: Specifications for individual materials – Sheet 1: Filled glass paper*

IEC 60819-3-2:2001, *Non-cellulosic papers for electrical purposes – Part 3: Specifications for individual materials – Sheet 2: Hybrid inorganic-organic paper*

IEC 60819-3-3:2008, *Non-cellulosic papers for electrical purposes – Part 3: Specifications for individual materials – Sheet 3: Unfilled aramid (aromatic polyamide) papers*

IEC 60819-3-4: 2001, *Non-cellulosic papers for electrical purposes – Part 3: Specifications for individual materials – Sheet 4: Aramid fibre paper containing not more than 50 % of mica particles*

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply:

3.1
full width material
material of production width, for example about 1 m, as ordered

3.2
slit material (tape)
material cut from full width material

3.3
duplex material
laminate consisting of two layers of insulating materials

3.4
triplex material
laminate consisting of three layers of insulating materials

3.5
quadruplex material
laminate consisting of four layers of insulating materials

4 Designation

Particular types of combined flexible insulating materials may be designated by using the relevant combinations of code letters for the form and nature of the main components, separated by a hyphen.

EXAMPLES: F – PI,
C – G.

The more commonly used materials are listed in Table 1.

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1 To be published.

Specific characteristics of a particular combined material (duplex or triplex, particular characteristics of the basic material, impregnating material, bonding agent, etc.) are described by additional data following the designation in Table 1.

EXAMPLE for designation: P-C/F-PET is a layer of paper consisting of cellulose, laminated with a film consisting of polyethylene terephthalate.

In some cases, the identification of specific characteristics such as the following may be useful:

Absorbent - porous	Calendered type
Lengthwise oriented	Lengthwise reinforced
Creped	Embossed
Varnished	Impregnated

NOTE This list is for guidance only and is not limiting. Code designations are in accordance with ISO standards.

Table 1 – Commonly used flexible materials

Form of component	Code designation	Nature of the component	Code designation	IEC normative reference
Film	F	Polyethylene terephthalate	PET	60674-3-2
		Polyethylene naphtalate	PEN	60674-3-8
		Polyimide	PI	60674-3-4
Paper and non-woven fabric and mats	P	Cellulose paper	C	60554-3-1; 60641-3-2
		Aramid paper (Aromatic Polyamide)	PAa	60819-3-3; 60819-3-4
		Polyethylene terephthalate non woven	PET	n. a.
		Filled glass paper	FG	60819-3-1
		Hybrid inorganic/organic paper	H	60819-3-2
Woven fabrics	C	Cellulose Glass Polyethylene terephthalate	C G PET	n. a.
Adhesive	A	Thermoplastic Thermosetting	Tp Ts	n. a.
n.a. = not available				

5 General requirements

5.1 The material may be delivered in sheets cut to length or in rolls.

5.2 All materials in any one consignment shall be consistent and have properties within the limits of this standard throughout the whole sheet or throughout the whole length of each roll. The surface shall be uniform, reasonably smooth and reasonably free from defects such as bubbles, pin holes, creases and flaws.

5.3 When delivered in rolls, it shall be capable of being unrolled without damage.

5.4 The combined materials shall be free of conducting particles and other undesirable inclusions.

5.5 Materials delivered in sheets cut to length shall be reasonably free from warp.

NOTE After bonding, materials produced in roll form often assume a "roll set" which depends upon time and temperature of storage. Sheets made from such rolls may require appreciable time before warp is relieved.

6 Dimensions

Thickness and thickness tolerances are dealt with in IEC 60626-3. Other dimensions and tolerances shall be agreed by the purchaser and the supplier.

7 Joins

For material in roll form, the allowable frequency of joins, the details of their construction, and identification shall be agreed by the purchaser and the supplier.

8 Conditions of supply

Material in roll form shall be supplied on cardboard roll or other suitable core. The inner diameter of the core shall be agreed by purchaser and supplier, and it should preferably be 55 mm, 76 mm or 150 mm.

Material in sheet form shall be supplied in stacks.

The material shall be placed in a packing which ensures adequate protection during transport, handling and storage.

Each unit pack, and each package containing a number of unit packs, shall have the following information clearly and indelibly marked on it:

a) the reference to this standard;

b) the designation of the type, in accordance with Clause 3;

c) for materials delivered in rolls: the width and the length or weight of each roll;

d) for materials delivered in sheets: the dimensions of the sheets and the number of sheets in a stack or the mass of the stack;

e) the nominal thickness of the material;

f) the number of rolls or stacks in a larger package;

g) the date of manufacturing;

h) information about joins as required by IEC 60626-3.

Any special conditions of supply, such as requirements regarding shelf life, shall be agreed by the purchaser and the supplier.

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