

Non-cellulosic papers for electrical purposes —

Part 3: Specifications for individual materials — Sheet 1: Filled glass paper

The European Standard EN 60819-3-1:2001 has the status of a
British Standard

ICS 29.035.10

National foreword

This British Standard is the official English language version of EN 60819-3-1:2001. It is identical with IEC 60819-3-1:2001

The UK participation in its preparation was entrusted to Technical Committee GEL/15, Insulating materials, to Subcommittee GEL/15/3/10, Flexible composites and textiles, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

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Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 29 November 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 6, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

English version

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

Papiers non cellulosiques à usages
électriques
Partie 3: Spécifications pour
matériaux particuliers
Feuille 1: Papier chargé à base de
fibres de verre
(CEI 60819-3-1:2001)

Vliesstoffe auf Kunststofffaserbasis
für elektrotechnische Zwecke
Teil 3: Bestimmungen für einzelne
Materialien
Blatt 1: Gefüllte Glaspapiere
(IEC 60819-3-1:2001)

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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.

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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 15C/1205/FDIS, future edition 1 of IEC 60819-3-1, prepared by SC 15C, Specifications, of IEC TC 15, Insulating materials, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60819-3-1 on 2001-09-01.

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) 2002-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-09-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60819-3-1:2001 was approved by CENELEC as a European Standard without any modification.

INTRODUCTION

This part of IEC 60819 is one of a series which deals with non-cellulosic papers for electrical purposes.

The series consists of three parts:

Part 1: Definitions and general requirements (IEC 60819-1)

Part 2: Methods of test (IEC 60819-2)

Part 3: Specifications for individual materials (IEC 60819-3).

This standard contains one of the sheets comprising part 3 as follows:

Sheet 1: Filled glass paper.

NON-CELLULOSIC PAPERS FOR ELECTRICAL PURPOSES –

Part 3: Specifications for individual materials – Sheet 1: Filled glass paper

1 Scope

This sheet of IEC 60819-3 specifies requirements for two types of filled glass paper designated:

P-FG type 1: high inorganic content paper with maximum organic content 15 %;

P-FG type 2: medium inorganic content paper with maximum organic content 25 %.

2 Normative references

The following normative documents contain provisions which, through reference in the text, constitute provisions of this part of IEC 60819. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60819 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 60819-1:1995, *Non-cellulosic papers for electrical purposes – Part 1: Definitions and general requirements*

IEC 60819-2, *Non-cellulosic papers for electrical purposes – Part 2: Methods of test*¹

3 Requirements

In addition to complying with the general requirements in IEC 60819-1, papers shall comply with the specific requirements appropriate to their type as given in table 1 and in 3.1, 3.2, 3.3, 3.4 and 3.5.

3.1 The average thickness of 10 measurements evenly distributed along a line at right angles to the machine direction of the paper of either type 1 or type 2 paper shall be within ± 15 % of the nominal thickness. Thickness measurements shall be made in accordance with clause 4 of IEC 60819-2.

3.2 Loss of mass on ignition at 625 °C for 1 h (see IEC 60819-2, clause 13) on the paper as received, deducting the moisture content, shall be:

- for P-FG type 1 not greater than 25 %;
- for P-FG type 2 not greater than 30 %.

¹ To be published.

3.3 Moisture content of type 1 paper shall not exceed 0,8 %.

Moisture content of type 2 paper shall not exceed 1,3 % (see IEC 60819-2, clause 12).

3.4 Minimum value of elongation at break for type 1 paper shall be 0,9 %.

Minimum value of elongation at break for type 2 paper shall be 2,3 %.

Determine elongation at break in accordance with IEC 60819-2, clause 7.

3.5 Thermal classification: based on long-term thermal ageing tests and the resulting Arrhenius graph, experience has shown that non-cellulosic papers listed in this sheet may be suitable for use in electrical apparatus and shall have a relative temperature index (RTI) up to 220 °C.

Table 1 – Physical and electrical requirements

Properties	Clause of IEC 60819-2	Units	Nominal thickness mm	Type 1		Type 2	
				Minimum	Maximum	Minimum	Maximum
Grammage	5	g/m ²	0,08	–	–	55	75
			0,13	108	146	97	131
			0,18	157	212	–	–
			0,25	231	312	221	299
			0,38	350	474	–	–
			0,50	461	624	–	–
			0,76	692	936	–	–
			1,50	1 429	1 934	–	–
Electrical strength	10	kV	0,08	–	–	0,7	NR
			0,13	0,9	NR	1,0	NR
			0,18	1,4	NR	–	–
			0,25	1,9	NR	2,7	NR
			0,38	2,7	NR	–	–
			0,50	3,6	NR	–	–
			0,76	4,4	NR	–	–
			1,50	6,8	NR	–	–
Tensile strength	7	N/10 mm	0,08	–	–	7	NR
			0,13	9	NR	9	NR
			0,18	14	NR	–	–
			0,25	21	NR	19	NR
			0,38	28	NR	–	–
			0,50	35	NR	–	–
			0,76	46	NR	–	–
			1,50	86	NR	–	–
NOTE NR: no requirement.							

Annex ZA
(normative)**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60819-1	1995	Non-cellulosic papers for electrical purposes Part 1: Definitions and general requirements	EN 60819-1	1995
IEC 60819-2	2001	Part 2: Methods of test	EN 60819-2	2001

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