

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Varnishes used for electrical insulation –  
Part 3: Specifications for individual materials –  
Sheet 1: Ambient curing finishing varnishes**

**Vernis utilisés pour l'isolation électrique –  
Partie 3: Spécifications pour matériaux particuliers –  
Feuille 1: Vernis de finition durcissant à température ambiante**

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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**VARNISHES USED FOR ELECTRICAL INSULATION –**

**Part 3: Specifications for individual materials –  
Sheet 1: Ambient curing finishing varnishes**

FOREWORD

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**IEC 60464-3-1 edition 2.1 contains the second edition (2001-07) [documents 15C/1221/FDIS and 15C/1250/RVD] and its amendment 1 (2006-01) [documents 15/254/FDIS and 15/281/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.**

International Standard IEC 60464-3-1 has been prepared by subcommittee 15C: Specifications, of IEC technical committee 15: Insulating materials.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of the [base publication and its amendment](#) will remain unchanged until the stability 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

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## INTRODUCTION

This part of IEC 60464 is one of a series which deals with varnishes used for electrical insulation. The series consists of three parts:

Part 1: Definitions and general requirements (IEC 60464-1);

Part 2: Methods of test (IEC 60464-2);

Part 3: Specifications for individual materials (IEC 60464-3).

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

Sheet 1: Ambient curing finishing varnishes.

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## VARNISHES USED FOR ELECTRICAL INSULATION –

### Part 3: Specifications for individual materials – Sheet 1: Ambient curing finishing varnishes

#### 1 Scope

This sheet of IEC 60464-3 gives the requirements for ambient curing finishing varnishes.

#### 2 Normative references

The following normative documents contain provisions which, through reference in the text, constitute provisions of this part of IEC 60464. 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 60464 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 60464-1:1998, *Varnishes used for electrical insulation – Part 1: Definitions and general requirements*

IEC 60464-2, *Varnishes used for electrical insulation – Part 2: Methods of test*<sup>1</sup>

#### 3 Designation

The purchase contract shall contain the material designation IEC 60464-3-1.

#### 4 Definitions and general requirements

For definitions and general requirements see clauses 4 and 5 of IEC 60464-1.

#### 5 Requirements

All material in a consignment shall comply with the requirements of IEC 60464-1 and shall, in addition, comply with the requirements given in this sheet.

Requirements for properties listed in table 1 are not included in this specification. When these are required, they should be agreed between supplier and purchaser. All tests, however, shall be carried out in accordance with IEC 60464-2, if not otherwise specified.

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<sup>1</sup> To be published.

**Table 1 – Property values to be agreed between supplier and purchaser when required**

Properties before drying and <del>or</del> curing	Properties after curing
Density	Bend test
Dilution ability	Cupping test
Stability <del>of varnish</del> in an open vessel	Resistance to liquids ( <del>inclusive of including</del> water)
Drying and/or curing in a thick layer	Dissipation factor and relative permittivity
Effect of varnish on enamelled wire	Breakdown voltage and electric strength
pH (W and E varnishes)	Resistance to mould growth
Volatile organic content (W and E varnishes)	Flash rusting of steel panels
Water content (W and E varnishes)	

### 5.1 Flash point

Flash point of the varnish, determined in accordance with 5.1 of IEC 60464-2, shall be not less than that agreed between supplier and purchaser. If in a particular country the safety regulations for the application of a material specify a minimum flash point, the material to be used in that country shall comply with that requirement.

### 5.2 Viscosity

Viscosity of the varnish, determined in accordance with 5.3 of IEC 60464-2, shall be within  $\pm 10\%$  of the nominal value. The nominal value and the method shall be stated in the purchase contract.

### 5.3 Content of non-volatile matter

Content of non-volatile matter, of the varnish determined in accordance with 5.4 of IEC 60464-2, shall be within  $\pm 2\%$  of the nominal value. The nominal value and the test conditions shall be stated in the purchase contract.

### 5.4 Tackiness

Tackiness of the varnish shall be determined according to 6.4.1 of IEC 60464-2. The varnish shall be non-tacky.

### 5.5 Resistance to vapour of solvents

Resistance of the varnish to vapour of solvents, according to 6.4.3 of IEC 60464-2, shall show no change in adherence, peeling, blistering, draining and no tackiness.

NOTE This test applies only in countries where legal requirements necessitate its use for materials included in "e" type equipment as defined in IEC 60079-7.

### 5.6 Effect of water immersion on volume resistivity

Volume resistivity of the varnish, determined in accordance with 6.5.1 of IEC 60464-2, shall not be less than  $10^{10} \Omega\text{m}$  before and  $10^6 \Omega\text{m}$  after immersion in water.

### 5.7 Temperature index

Method of test not applicable.

## Bibliography

IEC 60079-7, *Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety* "e"<sup>2</sup>

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<sup>2</sup> To be published.