

Solventless polymerisable resinous compounds used for electrical insulation —

Part 2: Methods of test —

Section 2.2 Coating powders

[IEC title: Specification for solventless polymerisable resinous compounds used for electrical insulation — Part 2: Methods of test — Test methods for coating powders for electrical purposes]

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Electrotechnical Engineering Standards Committee (GEL/-) to Technical Committee GEL/16 upon which the following bodies were represented:

- Adhesive Tape Manufacturers' Association
- British Ceramic Research Ltd.
- British Industrial Ceramic Manufacturers' Association
- British Paper and Board Industry Federation
- British Telecommunications plc
- Department of Trade and Industry (National Measurement Accreditation Service)
- ERA Technology Ltd.
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- Electricity Supply Industry in England and Wales
- Electronic Engineering Association
- Ministry of Defence
- RAPRA Technology Ltd.
- Rotating Electrical Machines Association (BEAMA Ltd.)
- Telecommunication Engineering and Manufacturing Association
- Transmission and Distribution Association (BEAMA Ltd.)

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Resin Manufacturers' Association
- British Resin Products Ltd.
- Oil and Colour Chemists' Association

This British Standard having been prepared under the direction of the General Electrotechnical Engineering Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1989

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National foreword

This Section of BS 5664 has been prepared under the direction of the General Electrotechnical Engineering Standards Committee. It is identical with IEC 455-2-2:1984 “*Specification for solventless polymerisable resinous compounds used for electrical insulation*” Part 2: “*Methods of test — Test methods for coating powders for electrical purposes*”, published by the International Electrotechnical Commission (IEC).

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

Additional information. Attention is drawn to the fact that certain values in this standard are given without tolerances. In some cases the accuracy obtained may not be of importance, but where it is important attention should be drawn to this in the purchase contract.

In **2.2** the visual examination of specimens by normal eyesight is required. This should be taken to permit visual examination with normally corrected vision.

For clarity the first sentence in **2.4.1.1** should read.

“The high voltage generator shall be capable of generating the required d.c. test voltage with a permissible deviation of $\begin{smallmatrix} +5 \\ -10 \end{smallmatrix} \%$.”

Similarly **2.4.1.3** should read.

“The upper electrode connected to the high voltage testing head shall consist of either flexible metal brushes whose bristles closely fit the surface of the specimen without leaving any free space during brushing of the surface or conductive rubber.

The metallic support serves as the other (back-plate) electrode and shall be connected to the protective (earth) conductor.”

Also for the sake of clarity the word “upper” should be inserted before “test electrode” in **2.4.3**.

In **2.5** “Scratch hardness” some clarification is required and this may be the subject of future amendment to IEC 455-2-2. Firstly **2.5.2** to **2.5.6** inclusive relate to method 2. Method 1 is contained in the reference standard ISO 1518.

The following hazard warning should be observed in relation to **2.13.4**.

Hazard warning. *Askarels for transformers and capacitors contain polychlorinated biphenyls which are toxic environmental contaminants. Askarel samples and wastes are to be handled and disposed of in accordance with national and/or local regulations.*

In **2.14** it indicates that the test for resistance to vapour of solvents applies only in countries where legal requirements necessitate its use for materials included in equipment with type of protection “e”, for use in potentially explosive atmospheres. In the UK there are no such specific legal requirements. This subclause is therefore inapplicable.

NOTE *Typographical errors.* In **2.8.1**, line 1 the item in brackets should read “(Erichson test)”. In **2.16.5**, line 1 the word “diagnosis” should read “diagonals”.

Cross-references

International Standard ^a	Corresponding British Standard
IEC 93:1980	BS 6233:1982 <i>Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials</i> (Identical)

International Standard ^a	Corresponding British Standard
IEC 112:1979	BS 5901:1980 <i>Method of test for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions</i> (Identical)
IEC 212:1971	BS 2844:1972 <i>Memorandum on conditioning of solid electrical insulating materials prior to and during testing</i> (Technically equivalent)
IEC 216-1:1974 ^b	BS 5691 <i>Guide for the determination of thermal endurance properties of electrical insulating materials</i> Part 1:1979 <i>General procedures for the determination of thermal endurance properties, temperature indices and thermal endurance profiles</i> (Identical)
IEC 394-2:1972	BS 5689 <i>Varnished fabrics for electrical purposes</i> Part 2:1979 <i>Methods of test</i> (Identical)
IEC 455-1:1974	BS 5664 <i>Solventless polymerisable resinous compounds used for electrical insulation</i> Part 1:1978 <i>Definitions and general requirements</i> (Identical)
IEC 455-2:1977	Part 2 <i>Methods of test</i> Section 2.1:1979 <i>Materials other than coating powders</i> (Identical)
ISO 60:1977	BS 2782 <i>Methods of testing plastics</i> Part 6 <i>Dimensional properties</i> Method 621A:1978 <i>Determination of apparent density of moulding material that can be poured from a funnel</i> (Identical)
ISO 1518:1973	BS 3900 <i>Methods of test for paints</i> Group E <i>Mechanical tests on paint films</i> Part E2:1970 <i>Scratch test</i> (Technically equivalent)

^a Undated in the text.

^b Withdrawn. Partly superseded by IEC 216-1:1987 for which there is as yet no equivalent British Standard. BS 5691 will be revised when the revision of all parts of IEC 216 has been completed.

The Technical Committee has reviewed the provisions of IEC 79-7, IEC 243, IEC 250, IEC 683-1 and ISO 2591, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

This standard is one of the series which deals with solventless polymerisable resinous compounds used for electrical insulation. The series will have the following three parts:

- *Part 1: Definitions and general requirements.*
- *Part 2: Methods of test.*
- *Part 3: Specifications for individual materials (under consideration).*

Scope

This standard gives methods of test for thermo-setting coating powders as defined in Sub-clause 3.7 of IEC Publication 455-1: Specification for Solventless Polymerisable Resinous Compounds used for Electrical Insulation, Part 1: Definitions and General Requirements. Tests are included for the material before cure and in the cured form.

Section 1. Tests for materials before cure

1.1 Bulk density

To be determined in accordance with ISO Standard 60: *Plastics — Determination of Apparent Density of Material that Can be Poured from a Specified Funnel.*

1.2 Pourability

1.2.1 Apparatus

- Funnel according to Figure 1, page 11, provided with means for placing it in a vertical position.
- Stop-watch or timer of comparable accuracy.

1.2.2 Procedure

Work powder sample on a sheet of paper until there is no tendency for the material to pack or cake. Place the funnel in a vertical position and close the small end with the hand or with a suitable strip and pour a 100 g sample of powder lightly into the funnel, avoiding any tendency to pack it. Then quickly open the bottom of the funnel and at the same instant start the stop watch or timer. Allow the powder to run freely from the funnel, and stop the watch or timer at the instant the last of it leaves the funnel.

1.2.3 Result

State the time, in seconds, required for the funnel to discharge, to the nearest 0.5 s or, if necessary, state that the material will not run through the funnel.

1.3 Particle size distribution

The following two methods are applicable:

1.3.1 Dry sieving in accordance with ISO Standard 2591: *Test Sieving, with sieve numbers and sizes specified in Part 3.*

1.3.2 Vacuum sieve analysis

Apparatus

- Analytical balance.
- Sieves and transparent sieve cover.

The vacuum sieving device shall be capable of maintaining a vacuum of 125 + 12.5 mm of water as measured by a manometer. The slit nozzle which rotates below the sieve shall revolve at a speed of 25 ± 2 rev/min.

NOTE Increasingly higher vacuums up to 700 mm of water are maintained for smaller sized sieves.