

Physical testing of rubber —

**Part C5: Determination of insulation
resistance —**

Methods of testing plastics —

Part 2: Electrical properties —

**Method 232: Determination of
insulation resistance —**

**(Implementation of
CENELEC HD 568 S1)**

Committees responsible for this British Standard

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- British Floor Covering Manufacturers' Association
- British Plastics Federation
- British Rubber Manufacturers' Association Ltd.
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- ERA Technology Ltd.
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- Federation of Resin Formulators and Applicators Ltd.
- Health and Safety Executive
- Medical Sterile Products Association
- Ministry of Defence
- RAPRA Technology Ltd.
- Tyre Manufacturers' Conference (Service Committee)

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National foreword

This British Standard has been prepared under the direction of the Plastics and Rubber Standards Policy Committee. It is identical with IEC 167:1964 *Methods of test for the determination of the insulation resistance of solid insulating materials*, published by the International Electrotechnical Commission (IEC), which has been endorsed by the European Committee for Electrotechnical Standardization (CENELEC) as HD 568 S1. This British Standard supersedes BS 903-C5:1983 and BS 2782-2:Method 232:1983, which are withdrawn.

Cross-reference

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)

^a Undated in the text.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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.

Section 1. General

1 Scope

These methods of test cover procedures for the determination of insulation resistance without discrimination between the volume and surface resistances involved. Because the test specimens are simply and easily prepared, these methods are particularly useful for rapidly determining values which will give a general indication of quality when great accuracy is not required.

2 Definitions

2.1

insulation resistance

the insulation resistance between two electrodes which are in contact with, or embedded in, a specimen, is the ratio of the direct voltage applied to the electrodes to the total current between them at a given time after the application of that voltage. It is dependent upon both the volume and surface resistances of the specimen

3 Significance

3.1 The methods for determining the insulation resistance of solid insulating materials give values of resistance which include, without discrimination, both volume and surface resistance. These methods consequently do not give well defined constants for the material, in contrast to the Recommended Methods of Test for Volume and Surface Resistivities (see IEC Publication 93). However, they give empirical values which can be used for the comparison of the quality of different insulating materials.

3.2 These methods are very useful for determining the influence of moisture on hygroscopic insulating materials, in which conditioning appreciably modifies not only the insulating properties of the surface but also those of the body of the material.

4 Test equipment

4.1 The insulation resistance may be determined either by a bridge method or by measuring the current and voltage. Brief descriptions of such measuring methods are given in Clause 14 a) of IEC Publication 93, Recommended Methods of Test for Volume and Surface Resistivities of Electrical Insulating Materials.

4.2 The applied voltage during the measurement shall be a direct voltage which is steady enough so that the charging current appearing when the voltage varies is negligible compared with the current flowing through the specimen. In some cases this may require the use of batteries.

Section 2. Electrodes

5 Electrodes

The electrodes shall be made of such a material that they will not corrode under the conditions of test or react with the material being tested. The following electrodes have been found to be satisfactory. The taper pin electrodes are generally used when the volume resistance is of primary interest. The other electrodes are used when the surface resistance is of primary interest.

6 Taper pin electrodes (for flat plates, tubes and rods)

Clean brass or steel pins of approximately 5 mm diameter and having a taper of approximately 2 % are used, the length being sufficient to comply with the requirements of Clause 9. These electrodes may be used with flat specimens, tubes and rods. (Figure 1 and Figure 2, pages 16 and 17), and are used by inserting them in two transverse parallel holes whose centres are 25 ± 1 mm apart (see Clause 9).

7 Conducting paint electrodes (for flat plates; tubes and rods)

Conducting paint may be used as an electrode material. The vehicle of the conducting paint should be of such a nature that it will not have any effect on the insulation resistance to be measured. Two equidistant stripes of conducting paint 1 mm wide are applied around tubes and rods so that the nearest edges are 10 ± 0.5 mm apart. (This can be easily done by mounting the tube or rod in a lathe and rotating it against a small brush or drawing pen containing the paint). This type of electrode may also be used on plate specimens. In this case the electrodes are two parallel stripes of conducting paint, 1 mm wide; the total length of each electrode is 100 ± 1 mm, and they are spaced 10 ± 0.5 mm apart. (Figure 3 and Figure 4, pages 18 and 19.)