



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Vulcanized fibre for electrical purposes - Part 2: Methods of test

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1 Scope

This Document gives methods of test for vulcanized fiber sheets for electrical purposes.

Material made by combining with an adhesive several thicknesses of vulcanized fiber is not covered by this Document.

Materials which conform to this Document meet established levels of performance.

However, the selection of a material by a user for a specific application is based on the

actual requirements necessary for adequate performance in that application and not based on this Document 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 provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 1411-2002 Dry, Solid Insulating Materials - Resistance Test to High-Voltage, Low-Current Arc Discharges (IEC 61621:1997, IDT)

GB/T 19264.2-2013 Pressboard and Presspaper for Electrical Purposes - Part 2: Methods of Test (IEC 60641-2:2004, MOD)

NOTE: There are no technical differences between the quoted contents from GB/T 19264.2-2013 and that from IEC 60641-2:2004.

ISO 178:2019 Plastics - Determination of Flexural Properties

NOTE: GB/T 9341-2008 Plastics - Determination of Flexural Properties (ISO 178:2001, IDT)

ISO 287:2017 Paper and Board - Determination of Moisture Content of a Lot - Oven-Drying Method

NOTE: GB/T 462-2008 Paper, Board and Pulp - Determination of Moisture Content of Analytical Sample (ISO 287:1985, ISO 638:1978, MOD)

4.3 Result As a general rule, the central value is reported as the result. When agreed between parties, the mean value may be reported. This shall be noted in the test report.

5 Thickness The thickness shall be determined as Clause 5 in GB/T 19264.2-2013.

Deviations from GB/T 19264.2-2013:

--- 10 spots alongside the circumference of the test piece shall be measured and the mean value of them shall be obtained.

6 Density

6.1 Apparent density The test shall be carried out on three conditioned test pieces; one determination is made on each of the three test pieces.

Use rectangular test pieces of an area no less than 100 cm² and determine the mass to an accuracy of 10^{-4} x mass of the test piece.

Make two measurements of the length and two of the width of each test piece to an accuracy of

0.1 mm at points at least 12 mm from the corners.

Determine the thickness by making eight measurements as indicated in Clause 5 and calculate the mean value of the measurements.

Calculate the apparent density ρ (the mass to volume ratio) as Formula (1):

Where:

ρ - apparent density, in g/cm³;

m - the mass, in g;

s - the mean of the eight thickness measurements, in cm;

l - the mean of the two length measurements, in cm;

w - the mean of the two width measurements, in cm.

Report all three values. The central value shall be taken as the result.

6.2 Density in liquid (specific gravity)

Use rectangular test pieces of an area not less than 16 cm² with the original thickness of the material. Determine the mass of the test piece weighed to an accuracy of $10^{-4} \times \text{mass}$ of the test piece in air and in liquid of known density at the temperature of test.

The density in liquid is calculated by the Formula (2):

Where:

ρ - density in liquid, in g/cm³;

m_1 - mass of test piece in air, in g;

m_2 - mass of test piece, in liquid, in g;

x - density of liquid, in g/cm³.

NOTE: Suitable liquids are: water, transformer oil, alcohol and other solvent.

7 Tensile Strength and Elongation Tensile strength and elongation shall be measured according to the method described in Clause

7 of GB/T 19264.2-2013.

Deviations from GB/T 19264.2-2013:

--- five measurements shall be made on the test pieces (20 $\pm$ 2) mm by 180 mm cut from both directions of test specimens;

--- the test length shall initially be (100 +/- 0.5) mm;

--- the load being applied at a rate of 60 mm/min and continued, the test piece breaks.

10 Electric Strength up to and including 3 mm in Thickness Electric strength shall be determined by the method specified in Clause 20 of GB/T 19264.2-2013.

Deviations from GB/T 19264.2-2013:

--- five measurements are made on the test pieces square of approximately 100 mm and of thickness of the sheet test;

--- the electrodes shall consist of two metal cylinders with the edges rounded to give a radius of (3.0 +/- 0.2) mm. One electrode shall be (25 +/- 1) mm in diameter and approximately 25 mm high. The other electrode shall be (75 +/- 1) mm in diameter;

--- the test pieces shall be dried in accordance with 4.2;

--- measure and record the thickness of each test piece.

The electric strength in kilovolts per millimeter is calculated by the Formula (4):

Where:

E - the electric strength, in kV/mm;

V - the breakdown voltage, in kV;

t - the thickness of the test piece after drying, in mm.

11 Arc Resistance Arc resistance to rupture shall be determined as specified in GB/T 1411-2002.

12 Chloride Content Any recognized method of determining chloride ions in a water extract is permitted.

13 Ash Content The amount of residue of material left after incineration of the material in the "as received" condition shall be determined according to the method described in Clause 14 of GB/T 19264.2-2013. The mass of the test piece shall be 5 g. Three determinations shall be made.

14 Flexibility (Bending)

The flexibility is determined using the measuring principle depicted in Figure 1.

A test piece is placed between the two jaws of the measuring device as shown in Figure 2. The jaws are closed until the test piece cracks or shows signs of rupture.

The flexibility tester is a small vise with jaws about 50 mm wide with small projections about 25 mm from the top edge of jaws against which the ends of specimens are placed. The movable jaw is equipped with a pointer and scale arrangement to indicate the decimal parts