BRITISH STANDARD

BS 3483-C5: 1974

Methods for

Testing pigments for paints —

Part C5: Determination of resistivity of aqueous extract

This part should be read in conjunction with the General Introduction to BS 3483 issued separately.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 3 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.

Amendments issued since publication

Amd. No.	Date	Comments

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Contents

NOTE This part of BS 3483 is technically identical with Part XIV of ISO/R 787, General methods of test for pigments.

1 Scope

Part C5 of this British Standard describes a general method of test for determining the resistivity (specific resistance) of the aqueous extract of a pigment. The method is applicable to all pigments and extenders, except pigments that are substantially soluble in water.

NOTE 1 It should be noted that the resistivity of the aqueous extract of a pigment should be considered as a property independent of the amount of water-soluble matter.

NOTE 2 The standard temperature of determination is 23 °C but a different temperature may be agreed between the parties provided that the necessary corrections are made to take account of the differences in temperature.

NOTE 3 When this general method is applicable to a given pigment, only a cross-reference to it should be included in the British Standard relating to that pigment, with a note of any detailed modification such as the use of cold water instead of boiling water which may be needed in view of the special properties of the pigment in question. Only when this general method is not applicable to a particular pigment should a special method for determination of resistivity of aqueous extract be specified.

2 Reagents

All reagents used shall be of recognized analytical reagent quality.

2.1 *Conductivity water,* resistivity not less than 2 500 Ω m at 23 °C.

2.2 *Methanol,* resistivity not less than 2 500 Ω m at 23 °C.

2.3 *Potassium chloride,* 0.02 M solution.

3 Apparatus

3.1 *Centrifuge* or ultra-centrifuge, if necessary.

3.2 *Filter paper,* fine-textured, which shall be washed with conductivity water on a filter funnel until the filtrate gives a specific resistance greater than 2 000 Ω m.

NOTE The diameter of the filter paper depends on the bulk density of the pigment. Some organic pigments require at least an 185 mm paper for satisfactory filtering.

3.3 *Cylinders,* with flanged bases, approximately 35 mm wide by 125 mm deep, or other containers suitable for use with the conductivity cell to be employed.

3.4 *Thermometer,* graduated in 0.2 °C intervals[1)].

3.5 *Conductivity bridge*[2)]

3.6 *Conductivity cell*[2)] having a cell constant K of approximately 1.

4 Sampling

The sample of pigment for the test shall be taken in accordance with the provisions of BS 4726[3)].

5 Determination of cell constant

5.1 Prepare a working standard solution of potassium chloride by diluting the 0.02M solution with conductivity water to a known concentration (see Notes 1 and 2 below). Measure the resistance R of this solution using the conductivity cell at 23° (or at an alternative agreed temperature with appropriate corrections) as described in **6.3**.

5.2 Calculate the cell constant K by means of the formula $K_{23} = R/\rho$ where R is the measured resistance, in ohms and ρ is the specific resistance at 23 °C of KCl solution of the concentration used, in Ω m (for an 0.002M solution this is 34.4 Ω m; see Figure 1).

NOTE 1 If a potassium chloride solution of different known concentration is used, the appropriate value of ρ should be read from the graph in Figure 1 for use in the calculation of the cell constant.

NOTE 2 In general, the cell constant is not greatly affected by variations in the strength of the potassium chloride solution, but for greatest accuracy a concentration of the potassium chloride solution should be used which has a similar resistance to that of the solution being tested and measurements should be made at values that utilise the middle third of the conductivity bridge scale.

6 Procedure

6.1 Test portion. Take sufficient of the sample to prepare two separate extracts.

6.2 Test for water-wettability of the pigment. Test a small amount of the pigment with boiling distilled water to see if it is water-wettable. Material which does not wet well with water is probably hydrophobic and should be treated as described in **6.3.2**. If the sample wets easily, proceed as described in **6.3.1**.

6.3 Determination

6.3.1 *Hydrophilic pigments.* Add 20 ± 0.01 g of the pigment to 180 g of boiling conductivity water (**2.1**) in a tared beaker of suitable capacity (see Note) with a stirring rod.

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1) Thermometers complying with BS 593, "Laboratory thermometers" are suitable.
2) Any commercially produced conductivity bridge and conductivity cell are likely to be satisfactory.
3) BS 4726, "*Sampling raw materials for paints and varnishes*".