INTERNATIONAL STANDARD

ISO 1437

Third edition
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Rubber compounding ingredients — Carbon black — Determination of sieve residue

Ingrédients de mélange du caoutchouc — Noir de carbone — Détermination du refus sur tamis

Reference number
ISO 1437:1992(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 1437 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Sub-Committee SC 3, *Raw materials (including latex) for use in the rubber industry*.

This third edition cancels and replaces the second edition (ISO 1437:1985), of which it constitutes a minor revision.

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Rubber compounding ingredients — Carbon black — Determination of sieve residue

1 Scope

This International Standard specifies a method for determining the water-wash sieve residue from regular, untreated carbon black for the rubber industry. It may not be applicable to oil-treated blacks because the oil could prevent proper wetting of the black by water.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 565:1990, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings.*

3 Principle

A known mass of carbon black is washed through a test sieve by a controlled flow of water, and the residue dried and weighed.

The test sieve aperture is chosen from the range given in the appropriate material specification.

4 Apparatus

4.1 Sieving apparatus (see figure 1), comprising the following main items:

4.1.1 Test sieve, on which the residue is retained. Test sieves shall be of phosphor bronze or stainless steel, having the characteristics described in ISO 565, and shall have nominal apertures of 500 µm, 125 µm and 45 µm.

4.1.2 Funnel or **container**, into the bottom of which the test sieve fits.

4.1.3 Nozzle, fed with clean water under controlled pressure by which the carbon black is washed through the sieve.

4.1.4 Water pressure regulating device.

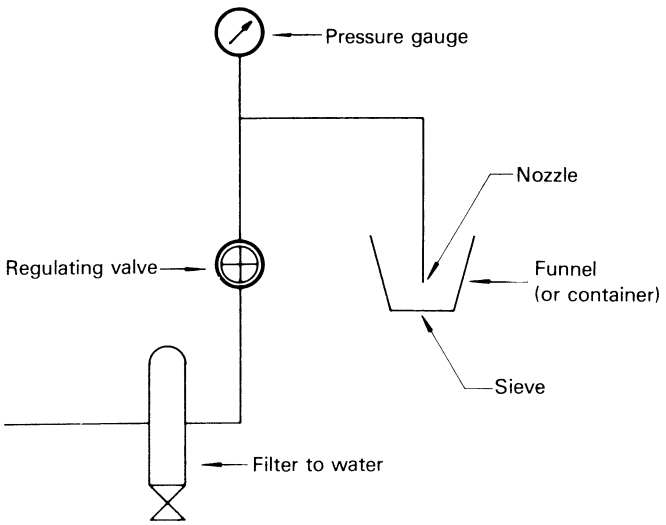

Figure 1 — Schematic diagram of apparatus

4.1.5 Filter, in the water supply line, incorporating a wire screen at least as fine as that in the test sieve.

The pipework downstream of the filter shall not be liable to corrosion by tap water (use copper or stainless steel, for example).

NOTE 1 Suitable apparatus includes the Gallie-Porrit type of apparatus and that recommended in ASTM D 1514-88, *Test method for carbon black — Sieve residue*. Details may be obtained from the Secretariat of ISO/TC 45/SC 3 (SCC).

4.2 Balance, with an accuracy of 0,1 g.

4.3 Analytical balance, with an accuracy of 0,1 mg.

4.4 Weighing dishes.

4.5 Oven, capable of being maintained at 105 °C ± 2 °C or 125 °C ± 2 °C.

5 Procedure

5.1 Precautions

5.1.1 Keep the apparatus clean at all times to prevent contamination.

5.1.2 Examine the sieve each time it is used to make sure no cracks or holes develop.

5.1.3 Examine the wire screen in the filter periodically to ascertain if the filter screen is in good condition.

5.2 Determination

5.2.1 Clean the filter used in the water lines before starting a test.

5.2.2 Regulate the water pressure to the recommended pressure of 0,2 MPa ± 0,04 MPa. Attach a sieve (4.1.1) of the specified aperture to the funnel or container (4.1.2) and allow water to flow through it for 3 min. Examine the sieve for particles. If none are observed, the apparatus is ready for use.

5.2.3 Weigh, to the nearest 0,1 g, a test portion of carbon black of at least 100 g.

5.2.4 Start the water flow. Add carbon black to the funnel or container. Use care in adding to prevent plugging of the sieve.

NOTE 2 A wetting agent may be used before starting the water flow.

5.2.5 Wash down the carbon black from the funnel or container sides. Continue to wash the residue on the sieve until the wash water coming through the sieve is clear.

5.2.6 Remove the sieve and rub the residue lightly with the finger to break up any agglomerates of carbon black which have not been thoroughly wetted by the water. Do not exert so much pressure with the finger that the sieve mesh is distorted.

5.2.7 Replace the sieve and wash for an additional 2 min.

5.2.8 Remove the sieve and dry in the oven (4.5) at 105 °C ± 2 °C or 125 °C ± 2 °C for 1 h.

5.2.9 Transfer the dried residue to a piece of smooth, white bond paper and rub gently to remove any carbon black remaining in the residue. Rub until the white paper no longer shows any smears.

5.2.10 Transfer the residue to a tared weighing dish (4.4) and weigh to the nearest 0,1 mg.

6 Expression of results

Calculate the sieve residue, expressed in parts per million (mg/kg), using the formula

$$\frac{m_1}{m_0} \times 10^6$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, of the residue retained on the sieve.

7 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) all details necessary for the identification of the sample;

c) the nominal values of the sieve apertures;

d) the type of apparatus used and the water pressure;

e) the temperature used (105 °C or 125 °C);

f) the results, and the units in which they have been expressed.

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