International Standard 1437

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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

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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International Standard ISO 1437 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

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ISO 1437 was first published in 1975. This second edition cancels and replaces the first edition, of which it constitutes a minor revision.

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Rubber compounding ingredients — Carbon black — Determination of sieve residue

1 Scope and field of application

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.

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2 Reference

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

3 Principle

Washing of a known mass of carbon black through a test sieve by a controlled flow of water, and drying and weighing of the residue.

The test sieve aperture is chosen from the range given as required by the appropriate material specification.

4 Apparatus

4.1 Sieving apparatus 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, 125 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.

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

NOTE — Suitable apparatus includes the Gallie-Porrit type of apparatus and that recommended in ASTM D — 1514. Details may be obtained from the Secretariat of ISO/TC 45 (BSI) or from the ISO Central Secretariat.

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 regulated at 105 ± 2 °C or 125 ± 2°C.

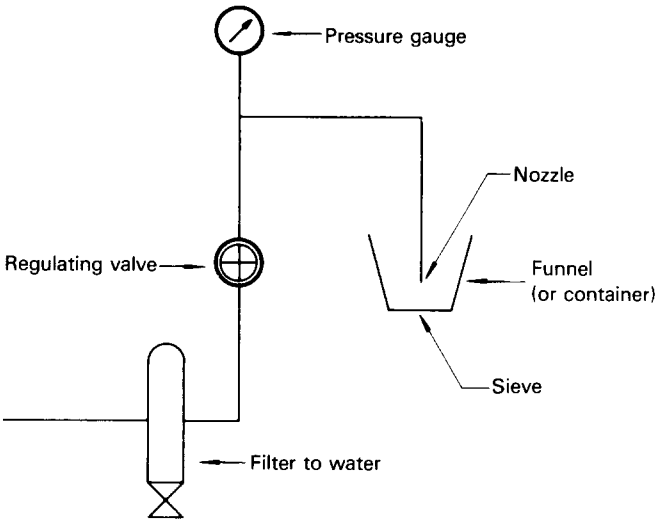

Figure — Schematic diagram of appartus

5 Procedure

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

5.2 Regulate the water pressure to the recommended pressure of 0,2 ± 0,04 MN/m^2. 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.

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

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

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

5.5. 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.

5.6. 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.

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

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

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

NOTE — **Precautions :**

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

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

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

6 Expression of results

The sieve residue, expressed as a percentage by mass, is given by the formula

$$\frac{m_1}{m_0} \times 100$$

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) reference to this International Standard;

b) proper identification of the sample;

c) indication of the nominal sieve apertures;

d) type of apparatus used and water pressure;

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

f) results and method of expression used.

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