

Rubber compounding ingredients — Carbon black — Determination of tinting strength

ICS 83.040.20

National foreword

This British Standard is the UK implementation of ISO 5435:2008. It supersedes BS5293-13:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/50, Rubber - Raw, natural and synthetic, including latex and carbon black.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Rubber compounding ingredients — Carbon black — Determination of tinting strength

*Ingrédients de mélange du caoutchouc — Noir de carbone —
Détermination du pouvoir colorant*



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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5435 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw materials (including latex) for use in the rubber industry*.

This fourth edition cancels and replaces the third edition (ISO 5435:1994), which has been technically revised to include two additional types of test equipment and precision data.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies a method for the determination of the tinting strength of carbon black relative to an industry tint reference black.

The method is based on the use of five different commercial instruments. Other instruments may be used if the test results for the standard reference blacks are within the control limits given in ASTM D4821.

NOTE The Densichron reflectometer and the Meeco Colormaster are no longer commercially available, but the procedures have been included for the benefit of those who still use these instruments.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1126, *Rubber compounding ingredients — Carbon black — Determination of loss on heating*

ASTM D4821, *Standard Guide for Carbon Black — Validation of Test Method Precision and Bias*

3 Principle

An industry tint reference black (ITRB) is mixed with zinc oxide and a liquid plasticizer. The paste obtained is mulled and homogenized, then spread as a layer of regular thickness. Its light reflectance is measured with a reflectometer sensitive to different shades of grey.

A test sample is mixed and its light reflectance measured in the same manner and, from the two light reflectance values, the relative tinting strength of the sample is determined.

4 Reagents and materials

4.1 Epoxidized soybean oil ¹⁾, for use as plasticizer, of relative density 0,92 to 0,99.

It is essential that the epoxidized soybean oil is maintained above 20 °C to prevent turbidity which leads to erroneous results.

4.2 Industry tint reference black (ITRB) ²⁾.

4.3 Zinc oxide, e.g. industry tint zinc oxide (ITZnO) ³⁾.

Other zinc oxides may be used, provided that they give the same results.

4.4 Standard reference blacks ⁴⁾.

5 Apparatus

5.1 Analytical balance, accurate to 0,1 mg.

5.2 Automatic muller ⁵⁾.

5.3 Oven, gravity convection type, capable of temperature regulation within ± 1 °C at 125 °C and temperature uniformity within ± 5 °C.

5.4 Flexible palette knives, preferably tapered, of stainless steel, 100 mm to 150 mm long.

5.5 Syringe, automatic filling, accurate to 0,02 cm³.

5.6 Light-measuring instrument, sensitive to variations in light reflectance of shades of grey (see the appropriate procedure in Clause 7).

5.7 Paste application apparatus (see the appropriate procedure in Clause 7).

1) Paraplex® G-62 is the trade name of an epoxidized soybean oil supplied by HallStar, 120 South Riverside Plaza, Suite 1620, Chicago, IL 60606, USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

2) ITRB is available from Balentine Enterprises, Inc., 227 Somerset St., Borger, TX 79007, USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

3) ITZnO is available from Horsehead Corp., 300 Frankfort Rd., Monaca, PA 15061, USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

4) Standard reference blacks are available from Balentine Enterprises, Inc., 227 Somerset St., Borger, TX 79007, USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the products supplied by this company. Equivalent products may be used if they can be shown to lead to the same results.

5) The Hoover Automatic Muller, Model M5, from Hoover Color Corp., PO Box 218, State Highway 693, Hiwassee, VA 24347, USA (e-mail: hoover@hoovercolor.com), and Automatic Pigment Muller, Model JEL 25/53, from J. Engelsmann AG, Frankenthaler Str. 137-141, D-67059 Ludwigshafen, Germany (e-mail: info@engelsmann.de) are examples of suitable products available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products. Equivalent products may be used if they can be shown to lead to the same results.