International Standard 3858 / 1

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Rubber compounding ingredients — Carbon black — Determination of light transmittance of toluene extract — Part 1 : Rapid method

Ingrédients de mélange du caoutchouc — Noir de carbone — Détermination de la transmittance spectrale de l'extrait toluénique — Partie 1 : Méthode rapide

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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 developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

International Standard ISO 3858/1 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 3858-1977), which had been approved by the member bodies of the following countries :

Australia	India	Spain
Belgium	Ireland	Sweden
Bulgaria	Italy	Thailand
Canada	Mexico	Turkey
France	Netherlands	United Kingdom
Germany, F. R.	Romania	USSR
Hungary	South Africa, Rep. of	Yugoslavia

No member body had expressed disapproval of the document.

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Rubber compounding ingredients — Carbon black — Determination of light transmittance of toluene extract — Part 1 : Rapid method

0 Introduction

ISO 3858 consists of the following parts :

— Part 1 : Rapid method.

— Part 2 : Method for product evaluation.

1 Scope and field of application

This part of ISO 3858 specifies a rapid method for the determination of the light transmittance of the toluene extract from carbon black by means of a spectrometer.

The method provides a qualitative indication of the degree of discoloration of toluene by carbon blacks for use in the rubber industry.

2 References

ISO 471, *Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces.*

ISO 1126, *Carbon black for use in the rubber industry — Determination of loss on heating.*

3 Principle

Drying of the carbon black and weighing of a test portion. Mixing with a measured volume of toluene at room temperature. Filtration of the mixture and transfer of the filtrate to an absorption cell. Measurement of the light transmittance of the filtrate against pure toluene at a set wavelength using a spectrometer.

4 Reagent

Toluene, analytical reagent grade.

5 Apparatus

Usual laboratory equipment and

5.1 Analytical balance, accurate to 0,01 g.

5.2 Oven, preferably gravity convection type, capable of being maintained at 105 ± 2 °C.

5.3 Spectrometer, giving direct readings of light transmittance at 425 nm, and with a selector for continuous variation, for example a high resolution prism or grating. Bandpass shall be within ± 10 nm (see note 1).

A constant voltage transformer shall be inserted into the supply circuit if the voltage is known to vary by more than 4 V.

The spectrometer shall be equipped with absorption cells, of thickness 10,00 ± 0,05 mm (see notes 2 and 3), with parallel sides polished flat to within 10 nm.

NOTES

1 Current types of colorimeters may differ by the width of a passing band and may therefore give different transmittance results. The results may be more comparable if such colorimeters are calibrated against the same high resolution spectrometer, for example having a passing band which is narrower than 2 nm at 425 nm mean wavelength, and the readings corrected by using the calibration curve for each instrument through the useful range of transmittance.

2 Cylindrical cells of inner diameter 10,00 ± 0,05 mm may give different results from parallelepipedic cells. If used, it is recommended that they be calibrated against a parallelepipedic cell over the full useful range of transmittance and that corrections be taken from the calibration curve.

3 If the cell used does not give a 10 mm optical path length, the transmittance which would be obtained through a cell of 10 mm is given by the equation

$$\lg \tau_0 = \frac{10}{l} \lg \tau - \frac{20}{l} + 2$$

where

τ_0 is the percentage transmittance through a 10 mm cell;

τ is the percentage transmittance observed through a cell of thickness l mm;

l is the thickness, in millimetres, of the cell used.

4 Absorption cells may differ in their transmittance. It is recommended that the same absorption cell be used for adjustment of the spectrometer.