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# INTERNATIONAL STANDARD ISO 3858

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## Carbon black for use in the rubber industry — Determination of light transmittance of toluene extract — Rapid method

*Noir de carbone pour l'industrie du caoutchouc — Détermination de la transmittance lumineuse de l'extrait toluénique — Méthode rapide*

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## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*, and was circulated to the member bodies in June 1975.

It has been approved by the member bodies of the following countries :

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

No member body expressed disapproval of the document.





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# Carbon black for use in the rubber industry — Determination of light transmittance of toluene extract — Rapid method

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a rapid method for the determination of the light transmittance of the toluene extract from carbon black by means of a spectrophotometer.

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*[1].

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 spectrophotometer.

## 4 REAGENT

**4.1 Toluene,** analytical reagent grade.

## 5 APPARATUS

**5.1 Analytical balance,** accurate to 0,01 g.

**5.2 Oven,** preferably gravity convection type, capable of maintaining a temperature of 105 ± 2 °C.

**5.3 Spectrophotometer** giving direct readings of light transmittance at 425 nm.

The spectrophotometer should be of the high resolution prism or grating type eliminating the use of an optical filter. Bandpass shall be within ± 10 nm.

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

NOTE — Current types of colorimeters may differ by the width of a passing band and may therefore give different light transmittance results. The results may be more comparable if such colorimeters are calibrated against the same high resolution spectrophotometer, 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 light transmittance.

**5.4 Absorption cells** with parallel sides polished flat to within 10 nm.

The internal distance between the parallel faces shall be 10,00 ± 0,05 mm (see notes 1 and 2).

NOTES

1 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 light transmittance and that corrections be taken from the calibration curve.

2 If the cell used does not give a 10 mm light path, the following formula may be used to calculate the light transmittance which would be obtained through a cell of 10 mm :

$$\log_{10} T_0 = \frac{10}{L} \times \log_{10} T - \frac{20}{L} + 2$$

where

$T_0$ is the percentage light transmittance through a 10 mm cell;

$T$ is the percentage light transmittance observed through a cell of path length $L$ mm;

$L$ is the path length, in millimetres, of the cell used.

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

**5.5 Conical flasks,** capacity 100 or 125 ml*.

**5.6 Graduated cylinder,** capacity 50 ml, with graduations of 1 ml.

**5.7 Test tubes,** capacity 50 ml.

1) At present at the stage of draft. (Revision of ISO/R 471.)

* The term millilitre (ml) is commonly used for the cubic centimetre ($cm^3$), particularly to denote the capacity of laboratory glassware. Apparatus with either type of marking is satisfactory to use with this standard.