TECHNICAL REPORT 8942

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Rubber compounding ingredients — Carbon black — Determination of individual pellet crushing strength

Ingrédients de mélange du caoutchouc — Noir de carbone — Détermination de la force d'écrasement des granules individuels

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ISO/TR 8942 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products.*

The reasons which led to the decision to publish this document in the form of a technical report type 2 are explained in the Introduction.

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0 Introduction

Carbon black for the rubber industry is generally pelletized to reduce dust and improve handling. The property of individual pellet crushing strength, among several other properties, can have an influence on the dispersion of carbon black in polymers, on bulk handling, and on conveying properties.

Following international efforts to develop a method for the determination of individual pellet hardness, it was agreed that a type 2 technical report should be prepared, since the results of two round-robin tests had shown that, although within-laboratory repeatability of the method under investigation was moderately acceptable, between-laboratories reproducibility was too great to allow the preparation of an International Standard.

It has been agreed to consider the investigation of a new apparatus. Since this will take a considerable amount of time, and since many laboratories are still using the apparatus that was featured in the round-robin tests, it was agreed that this Technical Report should be issued in the interim.

1 Scope and field of application

This Technical Report describes a method of determining the individual pellet crushing strength of carbon black for use in the rubber industry.

2 References

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

ISO 1124, *Rubber compounding ingredients — Carbon black shipment sampling procedures.* [1)]

3 Principle

A number of pellets with a narrow range of diameters is selected by sieving a carbon black sample. These pellets are placed one at a time between two parallel plates on a device capable of applying a force. The force applied when the pellet breaks is recorded.

4 Apparatus

Usual laboratory apparatus, and

4.1 Device capable of applying a force at a constant rate and of measuring the force as the pellet breaks.

The device shall

— have two parallel plates which remain truly horizontal throughout the complete test, with the upper plate transparent so that the pellet under test is clearly visible;

— be capable of applying a force at a constant rate of between 5 and 25 cN/s*;

— possess a means of measuring this force with an accuracy of 1 cN;

— have the base plate and the force applicator firmly fixed so as not to cause the pellet to roll or move, immediately prior to the test;

— be capable of being calibrated by dead-weights or by a force-measuring device that will verify the precision of the equipment over the range to be tested.

NOTE — An accurate, simple plate balance with a 200 g dial can be used as a measuring instrument. A force-application device is positioned above the balance plate.

1) At present at the stage of draft. (Revision of ISO 1124 : 1983 and ISO 1310 : 1974.)

* 1 cN/s ≈ 1,019 gf/s