

# International Standard



# 4659

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

## Rubber, raw styrene-butadiene (carbon black or carbon black and oil masterbatches) — Test recipe and method of evaluation

*Caoutchouc butadiène-styrène brut (mélanges-mâtres avec du noir de carbone ou avec du noir de carbone et de l'huile) — Formule d'essai et méthode d'évaluation*

Second edition — 1981-11-15

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UDC 678.7 : 678.028.27 : 620.1

Ref. No. ISO 4659-1981 (E)

**Descriptors** : rubber, synthetic rubber, styrene-butadiene rubber, test specimens, tests, vulcanizing.

Price based on 2 pages

## 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 4659 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*.

The first edition (ISO 4659-1977) had been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Belgium	Italy	Spain
Bulgaria	Korea, Rep. of	Sweden
Canada	Mexico	Turkey
Czechoslovakia	Netherlands	United Kingdom
France	Poland	USA
Germany, F. R.	Portugal	Yugoslavia
Hungary	Romania	

No member body expressed disapproval of the document.

This second edition, which supersedes ISO 4659-1977, incorporates draft Amendment 1, which was circulated to the member bodies in January 1980 and which has been approved by the member bodies of the following countries :

Belgium	India	Spain
Brazil	Italy	Sri Lanka
China	Korea, Rep. of	Sweden
Czechoslovakia	Mexico	Switzerland
Egypt, Arab Rep. of	Netherlands	Thailand
France	Poland	Turkey
Germany, F. R.	Romania	United Kingdom
Hungary	South Africa, Rep. of	USSR

The member body of the following country expressed disapproval of the document on technical grounds :

USA

# Rubber, raw styrene-butadiene (carbon black or carbon black and oil masterbatches) — Test recipe and method of evaluation

## 1 Scope and field of application

This International Standard specifies the standard materials, equipment and processing methods for evaluating the vulcanization characteristics of masterbatches of styrene-butadiene rubber (SBR) with carbon black or carbon black and oil.

## 2 References

ISO 37, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

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

ISO 1795, *Raw rubber in bales — Sampling.*

ISO 1796, *Raw rubber — Sample preparation.*

ISO 2393, *Rubber test mixes — Preparation, mixing and vulcanization — Equipment and procedures.*

ISO 3417, *Rubber — Measurement of vulcanization characteristics with the oscillating disc curemeter.*

## 3 Standard test recipe

### 3.1 Standard test formula

The standard test formula is given in the table.

The materials shall be NBS<sup>1)</sup> standard reference materials as indicated in the table, or shall be in accordance with equivalent national standards.

Table

Material	NBS standard reference material number	Parts by mass
Masterbatch	—	$100 + x^* + y^{**}$
Zinc oxide	370	3,00
Sulphur	371	1,75
Stearic acid	372	1,50
TBBS***	384	1,25
Total		$107,50 + x + y$

\*  $x$  is the number of parts of carbon black to 100 parts of polymer in the masterbatch.

\*\*  $y$  is the number of parts of oil to 100 parts of polymer in the masterbatch.

\*\*\* TBBS : *N-tert-butyl-2-benzothiazole sulphenamide*. This shall be supplied in powder form having an initial ether- or ethanol-insoluble matter content of less than 0,3 %. The material shall be stored at room temperature in a closed container and the ether- or ethanol-insoluble matter shall be checked every 6 months. If this is found to exceed 0,75 %, the material shall be discarded or recrystallized.

### 3.2 Procedure

#### 3.2.1 Equipment and procedure

Equipment and procedure for preparation, mixing and vulcanization shall be in accordance with ISO 2393.

1) National Bureau of Standards of the USA.