

ICS 83.060
CCS G 40



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 45596-2025

**Raw rubber or unvulcanized compounds - Determination of
green strength**

生橡胶或未硫化橡胶 胶料强度的测定

(English Translation)

Issued on: April 25, 2025

Implemented on: November 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

- Foreword
- Introduction
- 1 Scope
- 2 Normative references
- 3 Terms and definitions

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is equivalent to ISO 9026:2021 "Determination of strength of raw or unvulcanized rubber compounds".

Introduction

The stress-strain properties of unvulcanized rubber (either after compounding or in primary form) are of great importance to certain processing operations in the rubber industry.

This stress-strain property of uncured rubber is often referred to as "compound strength" and indicates that the final vulcanization process has not yet been completed.

The word "stock" is a synonym for rubber in its primary form or unvulcanized.

The strength of the rubber compound is mainly determined by the physical and chemical properties of the polymer, such as molecular weight, crystallinity, degree of branching, etc.

The formulation (especially the content of fillers, plasticizers and the presence of peptizers) is relevant. For all processing operations dominated by stretching, such as This is a particularly important characteristic because of the stretching caused by the expansion of the tire during the molding process.

The strength of the rubber compound also depends on the preparation method of the specimen (thermal or mechanical processing), the tensile speed and the test temperature. Therefore, the single-point method cannot The relationship between the strength of the rubber compound and the processing behavior during the entire processing process is given.

Determination of strength of raw or unvulcanized rubber compounds Warning 1---People

who use this document should have practical experience in formal laboratory work. This document does not indicate all possible safety For any problems, users are responsible for taking appropriate safety and health measures and ensuring that the conditions stipulated by relevant national laws and regulations are met.

Warning 2---Some of the steps specified in this document may involve the use or generation of certain wastes, which may cause harm to the local environment.

Appropriate safe operation and post-use waste disposal provisions should be specified in relevant documents.

1 Scope

This document describes a method for determining the strength of raw or unvulcanized rubber compounds by tensile stress-strain testing. Prepared under quasi-experimental conditions or cut from calendered film.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 2941-2025 Rubber physical test methods - General procedures for specimen preparation and conditioning (GB/T 2941-2025, ISO 23529:2016, IDT)

Note: GB/T 528-2009 Determination of tensile stress-strain properties of vulcanized rubber or thermoplastic rubber (ISO 37:2005, IDT)

Note: GB/T 15340-2025 Sampling and preparation methods of natural and synthetic raw rubber (ISO 1795:2017, IDT)

ISO 2393 Rubber test mixes-Preparation, mixing and vulcanization equipment and operating procedures

Note: GB/T 6038-2006 Rubber test compounds, mixing and vulcanization equipment and operating procedures (ISO 2393:1994, MOD)

ISO 5893:2019 Rubber and plastics tensile, flexural and compression test equipment (constant speed moving type) Technical requirements [Rubberand cation]

Note: GB/T 17200-2008 Rubber and plastics tension, compression and bending testing machine (constant speed drive) Technical specification (ISO 5893:2002, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Green strength

The resistance of raw or unvulcanized rubber to tensile deformation or fracture. It is a measure of the resistance of raw or unvulcanized rubber to tensile deformation or fracture during processing and manufacturing. A measure of resistance to deformation during tire building operations.

NOTE: Depending on the nature of the polymer, several types of curves can be obtained (see Figure 1). Usually, the strength of the rubber compound is expressed as the yield stress or the maximum stress.