

ICS 83.060

CCS G 40



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

GB/T 528-2009

**Rubber, vulcanized or thermoplastic -- Determination of tensile
stress-strain properties
(English Translation)**

Issued on: April 24, 2009

Implemented on: December 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Foreword...	3
1 Scope...	5
2 Normative references...	5
3 Terms and definitions...	6
4 Principle...	9
5 General...	9
6 Test pieces...	10
7 Apparatus...	11
8 Number of test pieces...	13
9 Preparation of test pieces...	13
10 Conditioning of sample and test pieces...	14
11 Marking of dumb-bell test pieces...	15
12 Measurement of test pieces...	15
13 Procedure...	15
14 Temperature of test...	17
15 Calculation of results...	17
16 Expression of results...	20
17 Test report...	20
Annex A (informative) Preparation of type B ring test pieces...	22
Annex B (informative) Precision...	25
Annex C (informative) Analysis of UP data and dumb-bell shape...	29
Bibliography...	33

Foreword

This Standard identically adopts ISO 37.2005 "Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties" (English version) and its corrigendum ISO 37.2005/Cor. 1.2008.

This Standard replaces GB/T 528-1998 "Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties".

This Standard is identical to the translation of ISO 37.2005 and ISO 37.2005/Cor.

1.2008.

For easy use, this Standard has the following editorial modifications.

- a) "this International Standard" is modified into "this Standard";
- b) USE the decimal point "." to replace the comma "," used as decimal point;
- c) DELETE the foreword of the International Standard;
- d) For easy use, ADD two notes (note in Clause 1 and note 2 in 13.1).

Main differences between this Standard and GB/T 528-1998 are.

- ADD a new dumb-bell test piece named type 1A (6.1 of this edition);
- ADD Annex B, which is about the precision data of type 1, type 2 and type 1A test pieces (Annex B of this edition);
- ADD Annex C, which is about the analysis of UP data and dumb-bell shape (Annex C of this edition);
- DELETE the Annex B in 1998 edition.

This Standard was proposed by China Petroleum and Chemical Industry Association. Annexes A and B of this Standard are normative annexes, Annex C is an informative annex.

This Standard shall be under the jurisdiction of Subcommittee on Rubber Physical and Chemical Test Methods of National Technical Committee on Rubber and Rubber Products of Standardization Administration of China (SAC/TC 35/SC 2).

Drafting organization of this Standard. Shenyang Research & Design Institute of Rubber Industry of Zhongxiang Group.

Participating drafting organizations of this Standard. Beijing Research & Design Institute of Rubber Industry, Chengde Precision Testing Machine Co., Ltd.

Main drafters of this Standard. Fei Kanghong and Ji Lianzhong.

Participating drafters of this Standard. Xie Junfang, Ding Xiaoying, Zhao Lingyun and Wang Xinhua.

The previous edition of the standards replaced by this Standard are as follows.

- GB/T 528-1992, GB/T 528-1998.

Rubber, vulcanized or thermoplastic - Determination

of tensile stress-strain properties

Warning. Personnel using this Standard shall have practical experience in formal laboratory work. This Standard does not purport to address safety issues that may arise from the use of this Standard. It is the responsibility of the user to take appropriate safety and health measures and to ensure compliance with the relevant national regulations.

1 Scope

This Standard describes a method for the determination of the tensile stress-strain properties of vulcanized and thermoplastic rubbers.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

Tensile strain, expressed as a percentage of the test length, produced in the test piece by a tensile stress.

4 Principle

Standard test pieces, either dumb-bells or rings, are stretched in a tensile-testing machine at a constant rate of traverse of the driven grip or pulley. Readings of force and elongation are taken as required during the uninterrupted stretching of the test piece and when it breaks.

5 General

Dumb-bell and ring test pieces do not necessarily give the same values for their respective stress-strain properties. This is mainly because in stretched rings the stress is not uniform over the cross-section.

6 Test pieces

The standard type B ring test piece shall have an internal diameter of $8.0 \text{ mm} \pm 0.1 \text{ mm}$. The median axial thickness and median radial width shall be $1.0 \text{ mm} \pm 0.1 \text{ mm}$. The radial width within any ring shall nowhere deviate from the median by more than

7 Apparatus

The instrument for measuring the thickness of dumb-bell test pieces and the axial thickness of ring test pieces shall be in accordance with that used in method A of GB/T 2941.

A calibrated cone gauge or other suitable equipment shall be used to measure the internal diameter of ring test pieces.

8 Number of test pieces

A minimum of three test pieces shall be tested.

9 Preparation of test pieces

Ring test pieces shall be prepared by cutting or punching, using the appropriate methods described in GB/T 2941, or by moulding.

10 Conditioning of sample and test pieces

For non-product tests the maximum time between vulcanization and testing shall be 4 weeks and, for evaluations intended to be comparable, the tests, as far as possible, shall be carried out after the same time interval.