

ICS 83.040.10

CCS B 72



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

GB/T 3517-2022

Replacing GB/T 3517-2014

**Rubber, raw natural - Determination of plasticity retention index
(PRI)**

Issued on: October 12, 2022

Implemented on: October 12, 2022

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

Table of Contents

Preface	
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Principle	1
5 instrument	2
6 Operating procedure	2
7 results show	3
8 Precision	3
9 Test report	3
Appendix A (Informative) PRI Determination of Air Change in Aging Chamber	4
Appendix B (informative) Notes on the precision of plasticity retention	6
Reference	8

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 replaces GB/T 3517-2014 "Determination of Plasticity Retention Ratio (PRI) of Natural Raw Rubber", and is consistent with GB/T 3517-2014

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope has been changed (see Chapter 1, Chapter 1 of the.2014 edition);
- b) Added the chapter "Terms and Definitions" (see Chapter 3);
- c) Changed the normative reference documents, changed GB/T 3510 to an undated reference document (see Chapter 4, 5.1, 5.2, 5.7, 6.1, 6.3, 4.7 of the.2014 edition);
- d) Changed the requirements for the aging box (see 5.5, 4.5 of the.2014 edition);
- e) Changed the regulations on lightweight aluminum plates and trays (see 5.6, 4.6 of the.2014 edition);

- f) Added the requirements for cigarette paper (see 5.7, 4.7 of the.2014 edition);
- g) Changed the text description of the preparation part of the sample and the thickness range of the sample (see 6.1, 5.1 of the.2014 edition);
- h) The provision on preheating trays and aluminum dishes was deleted (see 5.2 of the.2014 edition);
- i) Changed the regulations on starting timing in the aging operation (see 6.2, 5.2 of the.2014 edition);
- j) Change the determination time of the post-aging test (see 6.3, 5.3 of the.2014 edition);
- k) The test report has been changed (see Chapter 9, Chapter 8 of the.2014 edition).

This document is modified to adopt ISO 2930.2017 "Determination of Plasticity Retention Ratio (PRI) of Natural Raw Rubber".

The technical differences between this document and ISO 2930.2017 and their reasons are as follows.

--- Added the applicable boundary of the document (see Chapter 1) to meet the requirements of GB/T 1.1-2020;

--- ISO 23529.2016 (see 6.3) was replaced with GB/T 2941-2006 to adapt to my country's rubber physical test method samples

Prepare and regulate general program requirements;

--- ISO.2007 was replaced by GB/T 3510 (see Chapter 4, 5.1, 5.2, 5.7, 6.1, 6.3) to adapt to the use of rapid plasticity in my country

Requirements for determination of plasticity by counting method;

--- ISO 2393 (see 5.4) was replaced with GB/T 6038 to adapt to my country's requirements for rubber test compound batching, mixing and vulcanization equipment and

operating procedure requirements;

---Change the regulation on "lightweight aluminum dishes and trays" from a recommendation to a requirement (see 5.6, 5.6 of ISO 2930.2017) to meet the aging test inspection requirements;

--- ISO 1795 (see 6.1) was replaced with GB/T 15340 to meet the requirements of sampling and sample preparation for natural rubber in my country.

The following editorial changes have been made to this document.

--- Modify the symbol of the formula to the domestic customary symbol (see Chapter 7, Chapter 7 of ISO 2930.2017);

--- Change the reference ISO /T R9272 to GB/T 14838 (see B.1, B.1 of ISO 2930.2017), because ISO /T R9272

No currently valid version.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document describes a method for determining the plasticity retention (PRI) of natural rubber.

PRI is a measure of the thermal oxygen aging resistance of natural raw rubber, and the higher the value, the better the thermal oxygen aging resistance. PRI is not an absolute value, right

Absolute classification cannot be given due to the plasticity values of different natural rubbers after thermo-oxidative aging.

This document applies to the determination of natural raw rubber PRI.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

this document.

GB/T 2941-2006 Rubber physical test methods Specimen preparation and general procedures for conditioning (ISO 23529.2004, IDT)

GB/T 3510 Determination of Plasticity of Unvulcanized Rubber Rapid Plastometer Method (GB/T 3510-2006, ISO.2007.1997, IDT)

GB/T 6038 Rubber test compound batching, mixing and vulcanization equipment and operating procedures (GB/T 6038-2006, ISO 2393.

1994, MOD)

GB/T 15340 Sampling of natural and synthetic raw rubber and its sample preparation method (GB/T 15340-2008, ISO 1795.2000, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

ISO and IEC have established terminology databases for standardization purposes. The websites are as follows.

3.1

Plasticity value plasticitynumber

Under the specified pressure, time and temperature conditions, the thickness of the sample after deformation is taken as the measure of plasticity.

3.2

The ratio of the plasticity value (3.1) of the sample after aging in hot air at 140°C for 30 minutes to the plasticity value (3.1) before aging.

4 principles

Use a parallel plate plasticity meter with a diameter of 10mm to measure the unaged

The rapid plasticity value of the sample and the sample after heating and aging in the aging box at 140°C for 30 minutes.

PRI is the ratio of the rapid plasticity value (P30) of the sample after heat aging to the unaged rapid plasticity value (P0) multiplied by 100.