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

**GB/T 42122-2022**

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**Rubber, vulcanized or thermoplastic - Determination of  
abrasion resistance(the method of Improved Lambourn test  
machine)**

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### 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 modified to adopt ISO 23337.2016 "Determination of wear resistance of vulcanized rubber or thermoplastic rubber with improved Lamborn abrasion

Testing Machine Act".

The technical differences between this document and ISO 23337.2016 and their reasons are as follows.

--- Replaced ISO 525 (see 5.1 and Table B.1) with my country's standardization document GB/T 2484 to meet my country's standardization requirements;

--- Replaced ISO 8486-1 (see 5.1 and Table B.1) with my country's standardization document GB/T 2481.1 to adapt to my country's standardization

Require;

--- Added GB/T 9258.1 and JB/T 7498 two normative references (see 5.1 and Table B.1) to improve operability and facilitate

application of this document;

---Added a wear surface (see 5.1), that is, pasting sandpaper on the surface of the grinding wheel as the wear surface, so as to facilitate operation, save costs, and benefit

due to the stability of the data;

--- Increased the use of talc as anti-adhesive material related regulations (see 5.1 and Chapter 8), in order to improve data stability, suitable for my

China's current actual test technical conditions;

--- Added a 10.0mm sample thickness (see 7.1), which is suitable for low hardness samples.

--- Replaced ISO 23529 (see 7.3 and Table 2) with my country's standardization document GB/T 2941 to meet my country's standardization requirements;

--- Replaced ISO 2781 (see 9.3) with my country's standardization document GB/T 533 to adapt to my country's standardization requirements.

The following editorial changes have been made to this document.

--- In order to coordinate with existing standards, change the name of the standard to "Determination of Abrasion Resistance of Vulcanized Rubber or Thermoplastic Rubber (Modified Lambert

En Abrasion Testing Machine Method)";

--- Added note "different abrasive surfaces (grinding wheel or sandpaper), different anti-sticking materials (silicon carbide or talcum powder) and different spraying speeds , the test results cannot be compared. This information shall be indicated in the test report. " (see 5.1);

--- Added note "For samples with lower hardness, a thickness of 10.0mm is recommended. Different sample thicknesses, test results cannot Compare. " (see 7.1).

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

## Introduction

According to the application of rubber products, various types of laboratory test equipment have been developed in the past to determine the abrasion resistance of rubber compounds.

A type of equipment known as the "modified Lambourn" abrasion tester is briefly described in ISO 23794 [2] and is described in detail in this document.

Test methods for this equipment.

The main features of the improved Lambourn abrasion testing machine are as follows.

a) The slip ratio is adjustable due to the independent drive of the grinding wheel and the specimen. Servo mechanism is used to drive grinding wheel and sample to ensure speed control

system is accurate. In older equipment, both the grinding wheel and the specimen are driven by the same drive system, and the rotational speed is controlled by the brake

system, which can

Can lead to inaccurate slip ratio control.

b) In order to prevent the wear particles from sticking to the surface of the sample or the grinding wheel, spray anti-corrosion powder into the gap between the contact surface of the rubber sample and the grinding wheel in a controlled manner.

Sticky materials (silicon carbide or talc), which are important to obtain reproducible test results.

Abrasion test studies on compounds using a modified Lambourn Abrasion Tester have shown that at higher slip rates, wear resistance

In descending order. butadiene rubber (BR), natural rubber (NR), styrene-butadiene rubber (SBR) as the main material formulation, however, in

At low slip ratios, the order is reversed because truck and bus tires typically use natural rubber (NR) or natural rubber (NR) and

The compound compound of butadiene rubber (BR), while the compound with styrene-butadiene rubber (SBR) as the main material is used in car tires. detailed

See reference [3] for the content.

Determination of abrasion resistance of vulcanized or thermoplastic rubber  
(Improved Lamborn Abrasion Tester Method)

Caution 1 --- Personnel using this document need to have practical experience in formal laboratory work. This document does not indicate all possible safety

In case of problems, the user is responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated in the relevant national laws and regulations.

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 handling and post-use disposal of waste should be specified in relevant documents.

## 1 Scope

This document describes a method for the determination of the abrasion resistance of rubber using a modified Lamborn Abrasion Tester.

The disc-shaped rubber sample and the grinding wheel are pressed against each other under a specified load, and rotate at different linear speeds through an independent drive system.

The high speed causes relative slippage between the sample and the grinding wheel, which causes wear loss. The test results are expressed in unit wear time or unit stroke

Indicated by volume loss and/or abrasion resistance index compared to a reference compound.

The improved Lamborn abrasion testing machine can independently set various abrasion conditions, such as slip rate, line speed and load, and this method is suitable for each

Various rubber products, especially tire compounds, are evaluated under such harsh conditions. An example of a test for tire tread compounds is given in Appendix A.

## 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 533 Determination of density of vulcanized rubber or thermoplastic rubber (GB/T 533-2008, ISO 2781.2007, IDT)

GB/T 2481.1 Detection and marking of abrasive grain size composition for bonded abrasive tools Part 1.Coarse abrasive grains F4~F220

(GB/T 2481.1-1998, ISO 8486-1.1996, EQV)

GB/T 2484 General Requirements for Bonded Abrasives (GB/T 2484-2018, ISO 525.2013, MOD)

GB/T 2941 General procedure for specimen preparation and adjustment of rubber physical test methods (GB/T 2941-2006, ISO 23529.2004,

IDT)

GB/T 9258.1 Particle size analysis of abrasives for coated abrasives Part 1.Particle size composition (GB/T 9258.1-2000,

ISO 6344-1.1998, IDT)

JB/T 7498 coated abrasive sandpaper

Note. GB/T 25269-2010 Guidelines for Calibration of Rubber Test Equipment (ISO 18899.2004, IDT)