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

GB/T 47836.2-2026

**Rubber and rubber products - Determination of biobased
content - Part 2: Biobased carbon content**

橡胶和橡胶制品 生物基含量的测定 第2部分：生物基碳含量

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 2 of GB/T 47836, "Determination of Bio-based Content in Rubber and Rubber Products". GB/T 47836 has been published.

The following section.

--Part 1: General Principles and Calculation Methods for Using Rubber Compound Formulations;

--Part 2: Bio-based carbon content;

--Part 3: Bio-based substance content.

content".

This document has undergone the following structural adjustments compared to ISO.19984-2.2025.

--B.4.3 corresponds to B.4.2.3 of ISO.19984-2.2025.

The technical differences between this document and ISO.19984-2.2025, and the reasons therefor, are as follows.

--An accelerator mass spectrometer (see A.3.6) has been added because it is an essential piece of equipment for this document;

--The Zn reduction method (see A.4.2) has been added because this method is widely used.

The following editorial changes have been made to this document.

--Added information on accelerator mass spectrometry (AMS) and liquid scintillation counter (LSC) methods (see note 6.1);

--The note regarding the standard reference material SRM 4990c in the liquid scintillation counter method has been removed;

--ISO.19984.1 has been replaced by GB/T 47836.1, which is cited in the informational reference.

--Appendix E to ISO/TR 9272 has added a footnote.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Rubber and Rubber Products (SAC/TC 35).

Introduction

The use of biomass materials in rubber helps reduce the rubber industry's dependence on fossil resources and carbon dioxide emissions, thus mitigating global climate change.

Warmth promotes global environmental sustainability.

In GB/T 47836 "Determination of Bio-based Content in Rubber and Rubber Products" (all parts), biomass is used to describe the content of biomass derived from living organisms.

The term refers to biomaterials obtained from recently living organisms (such as wood and agricultural waste). Biomass is primarily composed of carbon, hydrogen, and oxygen.

It will also contain nitrogen and small amounts of other elements.

Biomass can now be readily obtained from a wide variety of plants and tree species for industrial-scale production. Today, biomass also includes materials used in the production of fibers or chemicals.

Biomass refers to plant or animal matter, or biodegradable waste. Biomass does not include organic matter transformed through geological processes, such as petroleum or coal.

Although fossil fuels originated from ancient biomass, they are not considered biomass by the generally accepted definition because they contain...

The carbon in the region has been removed from the modern carbon cycle.

GB/T 47836 specifies the method for determining the bio-based content in rubber and rubber products, which consists of three parts.

--Part 1: General Principles and Calculation Methods for Rubber Compound Formulation. The purpose is to describe how to formulate rubber and rubber products.

The components are categorized, and the bio-based content is calculated using the rubber

formulation and the chemical structure of each component.

--Part 2: Bio-based Carbon Content. The purpose is to describe how to determine bio-based carbon content through radiochemical analysis (determination of ^{14}C).

Carbon content. This can be obtained from the ratio of carbon atoms derived from biomass to the total carbon atoms in rubber or rubber products. (This formula...) the method can determine the content of bio-based carbon even without a rubber formulation.

--Part 3: Bio-based Material Content. The purpose is to describe how to separate the rubber compound into components and how to obtain the composition of each component.

The proportions and how to determine the biocarbon content of each component through chemical analysis, thereby obtaining the bio-based material content of each component.

The total bio-based content of the rubber compound was obtained by summing the values of all components.

Part 2: Bio-based Carbon Content Warning 1. Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

Warning 2. Using the procedures outlined in this document may involve the use and generation of certain substances, or the creation of waste. This may lead to...

Due to potential hazards to the local environment, safe handling and disposal should be carried out in accordance with relevant documents after use.

1 Scope

This document describes methods for determining the bio-based carbon content in rubber and rubber products (including polyurethane). These methods primarily determine the bio-based carbon content in rubber.

The concentration of the radioactive carbon isotope ^{14}C in the carbon atoms of glue or rubber products is used to determine whether the carbon-containing components are bio-based.

This document applies to rubber and rubber products, such as raw materials, compounds, and finished products.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 123 Rubber latex sampling Note. GB/T 8290-2021 Latex Sampling (ISO 123:2001, MOD) ISO 124 Determination of total solids content in latex Note. GB/T 8298-2017 Determination of total solids content in latex (ISO 124:2014, IDT) ISO 1382 Rubber Vocabulary Note. GB/T 9881-2026 Rubber Terminology (ISO 1382:2025, MOD) and further preparative procedures) Note. GB/T 15340-2025 Sampling and sample preparation methods for natural and synthetic raw rubber (ISO 1795:2017, IDT) ISO 1928 Determination of gross calorific value of coal and coke Note. GB/T 213-2008 Method for determination of calorific value of coal (ISO 1928:1995, MOD) ISO 4661-2 Preparation of vulcanized rubber specimens and samples - Part 2: Chemical testing (Rubber, vulcanized-Preparation) of samples and test pieces-Part 2: Chemical tests) Note. GB/T 17783-2019 Preparation of chemical test specimens and samples of vulcanized or thermoplastic rubber (ISO 4661-2:2018, MOD) ISO 15528 Paints, varnishes and raw materials for paints and varnishes-Sampling) Note. GB/T 3186-2006 Sampling of raw materials for paints, varnishes and paints and varnishes (ISO 15528:2000, IDT) ISO 19242 Determination of total sulfur content by ion chromatography in rubber chromatography) Note. GB/T 41946-2022 Determination of total sulfur content in rubber by ion chromatography (ISO 19242:2021, IDT) ISO.19984-1 Rubber and rubber articles - Determination of bio-based content - Part 1: General principles and calculations using rubber compound formulations Method (Rubber and rubber products-Determination of biobased content-Part 1: General principles and cal-