

ICS 65.160
CCS X 87



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

GB/T 22838.3-2025

Replacing GB/T 22838.3-2009

**Determination of physical characteristics for cigarettes and
filter rods - Part 3: Circumference - Non-contact optical method**

卷烟和滤棒物理性能的测定 第3部分：圆周 非接触光学法

(English Translation)

Issued on: October 31, 2025

Implemented on: May 1, 2026

Issued by: State Administration for Market Regulation

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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 3 of GB/T 22838 "Determination of Physical Properties of Cigarettes and Filter Rods". GB/T 22838 has been published with the following...

part.

- Part 1: Cigarette Packaging and Labelling;
- Part 2: Length Photoelectric Method;
- Part 3: Circumferential Non-Contact Optical Methods;
- Part 4: Cigarette Quality;
- Part 5: Cigarette draw resistance and filter pressure drop;
- Part 6: Hardness;
- Part 7: Cigarette Dust Content;
- Part 8: Moisture Content;
- Part 9: Empty Cigarette Ends;
- Part 10: Bursting Mouth;
- Part 11: Cigarette Extinguishing;
- Part 12: Cigarette Appearance;
- Part 13: Filter Rod Roundness;
- Part 14: Filter Rod Appearance;

---Part 15: Definition and Measurement Principle of Cigarette Ventilation;

---Part 17: Measurement of tobacco shreds falling from the end of a cigarette using the vibration method.

This document replaces GB/T 22838.3-2009 "Determination of Physical Properties of Cigarettes and Filter Rods Part 3: Circumferential Laser Method", and is consistent with...

Compared with GB/T 22838.3-2009, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope of application has been changed (see Chapter 1, Chapter 1 of the 2009 edition);
- b) The terms and definitions of "diameter" and "relative ellipticity" have been changed (see 3.1, 3.8; 3.1, 3.5 in the 2009 edition);
- c) Six terms and definitions have been added. "convex cross section," "perimeter," "circumference," "relative roundness," "circumferential standard bar," and "reference standard bar" (see [link]).
3.2~3.4, 3.9~3.11);
- d) The relevant content of the principle has been changed (see Chapter 4, Chapter 4 of the 2009 edition);
- e) Added relevant content on experimental conditions (see Chapter 5);
- f) Changes were made to the relevant information regarding instruments and equipment (see Chapter 6, Chapter 5 of the 2009 edition);
- g) The relevant content regarding the test sample conditioning conditions record has been deleted (see 7.1 in the 2009 edition);
- h) The calibration method has been changed (see 8.2, 7.2 in the 2009 version);
- i) The relevant test content has been changed (see 8.3, 7.3 in the 2009 version);
- j) The relevant content regarding the presentation of results has been changed (see Chapter 9, Chapter 8 of the 2009 edition);
- k) Changes were made to the content related to repeatability and reproducibility (see Chapter 10, Chapter 9 in the 2009 edition);
- l) The relevant content of the test report has been revised (see Chapter 11, Chapter 10 of the 2009 edition);
- m) The material and accuracy requirements for the circumferential standard bar have been changed (see D.1, A.1 in the 2009 edition).

This document is modified to adopt ISO 2971:2013 "Determination of nominal diameter of

cigarettes and filter rods - non-contact optical method".

This document has undergone the following structural adjustments compared to ISO 2971:2013.

- Chapter 6 corresponds to Chapter 5 in ISO 2971:2013;
- Chapter 7 corresponds to Chapter 6 in ISO 2971:2013;
- Chapter 8 corresponds to Chapter 7 in ISO 2971:2013;
- Chapter 9 corresponds to Chapter 8 in ISO 2971:2013;
- Chapter 10 corresponds to Chapter 9 in ISO 2971:2013;
- Chapter 11 corresponds to Chapter 10 in ISO 2971:2013;
- Appendix A corresponds to Appendix D in ISO 2971:2013;
- Appendix B corresponds to Appendix E in ISO 2971:2013;
- Appendix C corresponds to Appendix B in ISO 2971:2013;
- Appendix D corresponds to Appendix A in ISO 2971:2013;
- Appendix E corresponds to Appendix C in ISO 2971:2013.

The technical differences between this document and ISO 2971:2013, and the reasons therefor, are as follows.

---The definition of "circumference" has been changed (see 3.4), clarifying the value of π when converting between diameter and circumference, in order to improve the conversion results.

Accuracy;

---Two new terms and definitions have been added. "circumferential standard bar" and "reference standard bar" (see 3.10 and 3.11) to clearly define and standardize the circumference.

The relevant concepts of standard bars;

---Added content related to atmospheric conditioning and testing (see Chapter 5) to clarify test condition requirements;

---Added relevant content on circumferential standard bars (see 6.2) to clarify the relevant requirements for circumferential standard bars;

---The section on test sample conditioning conditions (see section 8.1 of ISO 2971:2013) has been removed to avoid conflict with test report requirements.

repeat;

---The calibration method has been changed (see 8.2) to clarify the relevant requirements for instrument calibration;

---The testing-related content has been modified (see 8.3) to clarify the requirements for the circumference test;

---The relevant content regarding the representation of results has been modified (see Chapter 9) to ensure consistency with relevant national standards and to meet the requirements of my country's circumference measurement standards.

Practical requirements;

---The content that test reports should include has been expanded (see Chapter 11) to align with GB/T 22838.5-2024.

The following editorial changes have been made to this document.

---To harmonize with existing standards, the standard title has been changed to "Determination of Physical Properties of Cigarettes and Filter Rods Part 3: Circumferential Non-contact..." Optical Methods;

---The definition of relative roundness (see 3.9) is changed from "100 minus relative ellipticity" to "100% minus relative ellipticity";

---The formula for the average apparent diameter of the cross-section (see Appendix C) is derived from " $D_m = 2\pi \int_0^{2\pi} D(\alpha) d\alpha$ " should be changed to " $D_m = 2\pi \int_0^{2\pi} D(\alpha) d\alpha$ ".

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 State Tobacco Monopoly Administration.

This document is under the jurisdiction of the National Tobacco Standardization Technical Committee (SAC/TC144).

Introduction

The physical properties of cigarettes and filter rods are important indicators for evaluating the quality of cigarette production and processing. GB/T 22838 "Physical Properties of Cigarettes and Filter Rods" the "Determination of" consists of the following 16 parts, depending on the detection object and detection method.

---Part 1: Cigarette Packaging and Labelling. The purpose is to specify the methods for determining cigarette packaging labelling and cigarette packaging.

---Part 2: Length Photoelectric Method. The purpose is to define a photoelectric method for measuring the length of cigarettes and filter rods.