

ICS 65.160
CCS X 87



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

GB/T 23356-2024

Replacing GB/T 23356-2009

**Cigarettes - Determination of carbon monoxide in the vapour
phase of cigarette smoke - NDIR method
(English Translation)**

Issued on: October 26, 2024

Implemented on: May 1, 2025

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

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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 is required.

This document replaces GB/T 23356-2009 "Determination of carbon monoxide in the gas phase of cigarette smoke - Non-scattering infrared method" and is in line with GB/T

23356-Compared with 2009, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Changed the volume requirements for collection air bags (see 6.3, 5.3 of the 2009 edition);
- Changed the provisions on the sampling rate of non-scattered infrared analyzers (see 6.4, 5.4 of the 2009 edition);
- Changed the accuracy requirements for thermometers (see 6.8, 5.7 of the 2009 edition);
- Changed the carbon monoxide standard gas concentration (see Chapter 5, 7.3.2 and 7.3.5, and Chapter 6, 8.2.2 and 8.2.5 of the 2009 edition);
- Deleted the provisions on sampling (see Chapter 7 of the 2009 edition);
- Changes to the regulations on cigarette smoking (see 7.4.2, 8.3.2 of the 2009 edition);
- Added the requirement for recalibration of non-scattered infrared analyzers (see 7.5.1).

This document is modified to adopt ISO 8454:2024 "Determination of carbon monoxide in the gas phase of cigarette smoke - Non-scattered infrared method".

Compared with ISO 8454:2024, this document has the following structural adjustments.

- Chapter 5 corresponds to Chapter 6 of ISO 8454:2024;
- Chapter 6 corresponds to Chapter 5 of ISO 8454:2024;
- Added 7.1, and postponed the numbers of other articles in Chapter 7;
- 10.1 corresponds to Chapter 10 of ISO 8454:2024;
- Added Appendix A.

The technical differences between this document and ISO 8454:2024 and their reasons are as follows.

- GB/T 16447 replaced ISO 3402, GB/T 16450 replaced ISO 3308, GB/T 19609 with the normative reference Replaced ISO 4387 and cited corresponding national standards to facilitate the understanding and implementation of this document;
- Changed the repeatability and reproducibility related content in ISO 8454:2024 (see Chapter 9) to suit the current situation in China;
- Added content related to the preparation of smoking cigarettes (see 7.1) to suit my country's national conditions and facilitate the operation and implementation of the standard;
- Added the calculation formula for the average mass of carbon monoxide per cigarette under standard conditions [see formula (3)] to facilitate the calculation under standard

conditions Perform quick calculations;

--Added detailed content of the test report (see 10.2~10.5), which is suitable for my country's national conditions and facilitates the operation and implementation of the standard.

The following editorial changes have been made to this document.

-- Added informative Appendix A "Repeatability Limits and Reproducibility Limits of the Method".

1 Scope

This document describes a method for the non-dispersive infrared determination of carbon monoxide in the gas phase of cigarette smoke.

This document applies to the determination of carbon monoxide in the gas phase of cigarette smoke.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 16447 Atmospheric conditions for the conditioning and testing of tobacco and tobacco products (GB/T 16447-2004, ISO 3402:1999, IDT) GB/T 16450 Definitions and standard conditions for smoking machines for routine analysis (GB/T 16450-2004, ISO 3308:2000, MOD) GB/T 19609 Cigarettes - Determination of total particulate matter and tar using a smoking machine for routine analysis (GB/T 19609-2024, ISO 4387.

2019, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

vapor phase

Use a smoking machine that complies with the requirements of GB/T 16450 and the smoke passing through the smoke collector during cigarette smoking according to GB/T 19609.

part.

clearing puff

Any puffing on a cigarette after it has been extinguished or removed from its holder.

4 Principles

According to GB/T 19609, smoke cigarettes, collect the gas phase of cigarette smoke, and measure the carbon monoxide with a non-scattering infrared analyzer to calculate the carbon monoxide content of each cigarette.

The amount of carbon monoxide in flue gas.

5 Reagents or materials

Use nitrogen with a purity of not less than 99.999% during the validity period as the mixed gas for carbon monoxide standard gas. Non-scattering infrared analyzer Calibration should be performed using at least three standard gases with known concentrations and a relative error of less than 2%. The concentration range of the standard gases should cover the range of the expected detection.

The carbon monoxide concentration should be adjusted to avoid extrapolation of the curve. Standard gases with carbon monoxide concentrations (volume fraction) of 1%, 3%, and 5% should be used.