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

GB/T 21782.2-2025

Replacing GB/T 21782.2-2008

**Coating powders - Part 2: Determination of density by gas
comparison pycnometer(referee method)**
(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 21782 "Powder Coatings". GB/T 21782 has already published the following parts.

- Part 1: Determination of particle size distribution by sieving method;
- Part 2: Determination of density using a gas comparative hydrometer (arbitration method);
- Part 3: Determination of density using the liquid displacement specific gravity bottle method;
- Part 4: Calculation of the Lower Explosive Limit;
- Part 5: Determination of the flowability of powder-air mixtures;
- Part 7: Determination of mass loss during baking;
- Part 8: Assessment of the storage stability of thermosetting powders;
- Part 9: Sampling;
- Part 10: Determination of Deposition Efficiency;
- Part 11: Determination of the Flowability of Inclined Plates;

---Part 12: Determination of compatibility;

---Part 13: Particle Size Analysis by Laser Diffraction;

---Part 14: Terminology.

This document replaces GB/T 21782.2-2008 "Powder Coatings - Part 2: Determination of Density by Gas Comparison Hydrometer Method (Arbitration)".

Compared with GB/T 21782.2-2008, the main technical changes in the "Law on the Protection of Minors" are as follows, except for structural adjustments and editorial modifications.

---The content of "Scope" has been changed, and the content related to the liquid displacement gravity method has been deleted (see Chapter 1, Chapter 1 of the 2008 edition);

---The material used has been changed from "air" or "helium" to "helium or nitrogen," increasing the gas purity requirements (see 5.1, 2008 edition).

Chapter 4);

---The schematic diagram of the instrument's structural measurement principle has been revised (see Chapter 6, Chapter 5 of the 2008 edition);

---The operating procedures have been modified to better suit actual operations (see Chapter 8, Chapter 7 of the 2008 edition);

---The representation of results and tolerances has been changed (see Chapter 9, Chapter 8 of the 2008 edition).

This document is modified to adopt ISO 8130-2:2021 "Powder coatings - Part 2: Determination of density by gas comparative hydrometer method (arbitration method)".

This document has undergone the following structural adjustments compared to ISO 8130-2:2021.

---Section 5.1 of "Materials" (see section 5.1 of ISO 8130-3:2021) has been deleted;

---Added section 6.1 to "Instruments" (see 6.1, Chapter 6 of ISO 8130-3:2021);

---Added sections 8.1, 8.2, and 8.3 to the "Operating Procedures" section, and reorganized the content for clearer semantics (see 8.1, 8.2, and 8.3, ISO).

Chapter 8 of 8130-3.2021);

---The chapter on "Precision" has been deleted. ISO 8130-3:2021 stated regarding precision as "Precision data is not yet available," and therefore does not possess [precision data].

Guiding significance (see Chapter 10 of ISO 8130-3:2021);

---Chapter 10 corresponds to Chapter 11 in ISO 8130-3:2021;

---The "References" section has been removed (see "References" in ISO 8130-3:2021).

The technical differences between this document and ISO 8130-3:2021, and the reasons therefor, are as follows.

---The accuracy requirements for balances have been increased, and the specifications for balances have been standardized to meet the actual operational needs in my country (see 6.1);

---The provision allowing other gases to be used as replacement gases in the "Materials" section has been removed, unifying the types of replacement gases and conforming to my country's actual situation.

Operational requirements (see Chapter 5, Chapter 5 of ISO 8130-3:2021);

---The first paragraph of "Instrument" and the content of "Note" have been deleted to reduce redundant descriptions and make the meaning clearer (see Chapter 6, ISO 8130-3:2021).

Chapter 6);

---The content about the manual gas comparative hydrometer in paragraph 6 of the "Operating Procedures" section has been deleted, as has the content of the "Notes" in this chapter.

In line with my country's actual operational needs (see Chapter 8 of ISO 8130-3:2021);

---Items f) and g) in the "Test Report" have been removed to meet the actual operational requirements in my country (see ISO 8130-3:2021, section [missing information]).

Chapter 11).

The following editorial changes have been made to this document.

---To facilitate the understanding and use of the standard, notes that are not consistent with my country's national conditions have been removed.

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 and is under the jurisdiction of the National Technical Committee on Standardization of Hazardous Chemicals Management (SAC/TC251).

Introduction

The GB/T 21782 series of standards covers the testing and evaluation of key indicators of powder coatings, such as particle size distribution, density determination, and storage stability.

This series of standards defines a set of tests and applications for powder coatings. Each document in this series describes a specific set of tests and applications. The GB/T 21782 series of standards aims to provide a standard for powder coatings.

This standard provides a unified and reliable testing process for manufacturers and powder coating testers, and supports product quality control, safe production, and international standards.

Trade provides scientific support. The GB/T 21782 series of standards is proposed to consist of the following 13 parts.

---Part 1: Determination of Particle Size Distribution by Sieving Method. The purpose is to specify two methods, manual and mechanical sieving, for determining particle size distribution.

Particle size distribution and mass percentage of residue on sieve in powder coatings.

---Part 2: Determination of Density by Gas Comparative Hydrometer Method (Arbitration Method). The purpose is to define a method for determining density based on the principle of gas displacement, using gas...

A method for determining the density of powder coatings using a volumetric specific gravity meter.

---Part 3: Determination of Density by Liquid Displacement Specific Gravity Bottle Method. The purpose is to define a method for determining density based on Archimedes' principle using liquid displacement specific gravity bottles.

A method for determining the density of powder coatings using a heavy-duty bottle.

---Part 4: Calculation of the Lower Explosive Limit. The purpose is to specify the calculation method for the lower explosive limit of powder coatings based on the total calorific value or the calorific value of the combustible components.

Methods to lower the limit.

---Part 5: Determination of the flowability of powder-air mixtures. The aim is to express, by measuring the fluidization factor and powder flow rate, the flowability of powder-air mixtures.

Characterize the flow properties of powder during transport and spraying.

---Part 7: Determination of mass loss during baking. The purpose is to specify the application methods for powder coatings onto substrates using electrostatic spraying.

A method for measuring mass loss during the curing and baking process.

---Part 8: Assessment of the Storage Stability of Thermosetting Powders. The aim is to assess the storage stability of thermosetting powder coatings by placing them in a specific