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

GB/T 12033-2025

Replacing GB/T 12033-2008

**Raw materials and pulps - Determination of carbohydrate
composition**

造纸原料和纸浆 碳水化合物组分的测定

(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 supersedes GB/T 12033-2008 "Determination of Carbohydrate Components in Papermaking Raw Materials and Pulp by Gas Chromatography" and is consistent with...

Compared with GB/T 12033-2008, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope has been changed, and ion chromatography has been added (see Chapter 1, Chapter 1 of the 2008 edition);
- b) Added terms and definitions (see Chapter 3);
- c) The principle has been changed (see Chapter 4, Chapter 3 of the 2008 edition);
- d) The instruments and equipment were changed (see Chapter 5, Chapter 5 of the 2008 edition);
- e) Reagents and materials have been changed (see Chapter 6, Chapter 4 of the 2008 edition);
- f) The sampling method has been changed (see Chapter 7, Chapter 6 in the 2008 edition);
- g) Sample preparation has been modified (see Chapter 8, Chapter 6 in the 2008 edition);
- h) The experimental procedures have been changed (see Chapter 9, Chapter 7 of the 2008 edition);
- i) The calculation of the results has been changed (see Chapter 10, Chapter 8 of the 2008 edition);

- j) The precision was changed (see Chapter 11, 9.3 of the 2008 edition);
- k) The test report was amended (see Chapter 12, Chapter 10 of the 2008 edition).

This document is modified to adopt ISO 21437:2020 "Determination of carbohydrate composition in pulp".

The technical differences between this document and ISO 21437:2020, and the reasons therefor, are as follows.

- a) The scope has been revised to include the determination of carbohydrate components in papermaking raw materials to meet industry requirements (see Chapter 1);
- b) ISO 638 (see 9.1) has been replaced with the normatively referenced GB/T 462 to adapt to my country's technical conditions;
- c) A normative reference document GB/T 6682 has been added to adapt to my country's technical conditions (see 6.1);
- d) ISO 7213 (see Chapter 7) has been replaced with the normatively referenced GB/T 740 to adapt to my country's technical conditions;
- e) ISO 14453 (see Chapter 7) has been replaced with the normatively referenced GB/T 22902 to adapt to my country's technical conditions;
- f) Added normative reference GB/T 2677.1, which standardizes the sampling of papermaking raw materials (see Chapter 7);
- g) A balance was added to standardize the experimental procedure (see 5.9);
- h) Sampling requirements have been changed, with increased requirements for sampling papermaking raw materials to ensure the accuracy of test results (see Chapter 7);
- i) Instrument reference test conditions for ion chromatography and gas chromatography have been added to facilitate the use of the documentation (see 9.4.1.4 and 9.4.2.7).

The following editorial changes have been made to this document.

---The standard name has been changed to "Determination of Carbohydrate Components in Papermaking Raw Materials and Pulp".

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 National Light Industry Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Paper Industry (SAC/TC141).

1 Scope

This document describes two methods for determining the carbohydrate content in papermaking raw materials and pulp. ion chromatography and gas chromatography.

This document applies to the determination of monosaccharides in oven-dried papermaking raw materials or pulp with a content exceeding 1 mg/g.

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.

GB/T 462 Determination of moisture content in analytical samples of paper, paperboard and pulp (GB/T 462-2023, ISO 287:2017, ISO 638-1.

2022, ISO 638-2:2022, MOD) GB/T 740 Sampling of pulp specimens (GB/T 740-2003, ISO 7213:1981, IDT) GB/T 2677.1 Sampling of test samples for analysis of papermaking raw materials GB/T 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD) GB/T 22902 Determination of acetone-soluble matter in pulp (GB/T 22902-2025, ISO 14453:2014, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

The content of five major neutral monosaccharides in papermaking raw materials and pulp, including arabinose, galactose, glucose, mannose and xylose.

Note: Units are expressed in milligrams per gram (mg/g).

4 Principles

A two-step acid hydrolysis using sulfuric acid hydrolyzes cellulose and hemicellulose in papermaking raw materials or pulp into a monosaccharide solution. Ionic...

The content of different monosaccharides was determined by chromatography (IC) or gas chromatography (GC), and quantification was performed using the internal standard method. If gas chromatography is used, after hydrolysis...

The sample is reduced and acetylated to form volatile derivatives, which are then analyzed by gas chromatography.

5 Instruments and Equipment

5.1

A grinding machine or equivalent equipment equipped with a sieve with a screen size of 0.425 mm (40 mesh).

5.2

Filtration equipment, including a filter flask, a glass frit filter crucible (medium or fine pores, 30 mL), a filter crucible adapter, and a siphon tube (can be used).