



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

GB/T 12914-2018

**Paper and board -- Determination of tensile properties --
Constant rate of elongation method (20mm/min)**

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Foreword

This Standard was drafted in accordance with the rules in GB/T 1.1-2009.

This Standard serves as a replacement of GB/T 12914-2008 Paper and Board - Determination of Tensile Properties. In comparison with GB/T 12914-2008, the main technical changes are as follows.

---The title of the Standard is modified;

---The Scope is modified (see Chapter 1; Chapter 1 of Version 2008);

---A statement of differences between this Standard of GB/T 22898-2008 [ISO 1924-3:2005, MOD] is added (see NOTE of Chapter 1);

---The terms and definitions are modified (see Chapter 3). the definitions of elongation (see 3.3) and strain (see 3.4) are added;

---Relevant content of constant-rate loading method is deleted (see Chapter 4 of Version 2008); standard chapters are re-arranged;

---Strain measurement accuracy is modified into elongation measurement

accuracy (see 5.1; 5.2.1.1 of Version 2008); supplementary statement of elongation measurement accuracy is added (see Note 2 of 5.1);

---The calculation formula of breaking length is added (see 9.5);

---The calculation formula of modulus of elasticity is modified (see 9.8; 10.8 of Version 2008);

---Relevant data of precision is added (see Table 2 and Table 3 of 10.3).

This Standard adopts the re-drafting method to modify and adopt ISO 1924-2:2008 Paper and Board - Determination of Tensile Properties - Part 2: Constant Rate of Elongation Method (20 mm/min).

In comparison with ISO 1924-2:2008, the main technical differences and their causes are as follows.

---In terms of Normative References, this Standard adjusts the technical differences, so as to adapt to the technical conditions in China. The adjustments are intensively reflected in Chapter 2 "Normative References". See the specific adjustments below.

? GB/T 450, which modifies and adopts international standard, is used to replace ISO 186;

? GB/T 451.2, which equivalently adopts international standard, is used to replace ISO 536;

? GB/T 451.3, which identically adopts international standard, is used to replace ISO 534;

? GB/T 10739, which equivalently adopts international standard, is used to replace ISO 187;

---In view of the fact that breaking length index is still extensively used in China, the definition and calculation formula of breaking length are added (see 3.6 and 9.5);

This Standard makes the following editorial modifications.

---With reference to ISO 1924-3, a supplementary statement of elongation

measurement accuracy is provided (see NOTE 2 of 5.1.2), so as to distinguish different test items' different requirements for elongation measurement accuracy;

---The letter codes of various tensile property indexes are modified (see Chapter 9), so as to facilitate instrument display, printing, and maintain consistency with relevant standards;

---The unit of tensile property is modified (see 9.3), the numerical value remains the same, so as to maintain consistency with relevant product standards and the existing instruments;

---Appendix B (informative) is added, which is a comparison of symbols between this Standard and ISO 1924-2:2008.

Please be noted that certain content of this document might involve patents. The issuing institution of this document does not undertake the responsibility of identifying these patents.

This Standard was proposed by China Light Industry Council.

This Standard shall be under the jurisdiction of National Technical Committee 141 on Paper Industry of Standardization Administration of China (SAC/TC 141).

The drafting organizations of this Standard. Sichuan Changjiang Papermaking Instrument Co., Ltd.; Shandong Century Sunshine Paper Group Co., Ltd.; China National Pulp and Paper Research Institute Co., Ltd.; National Paper Product Quality Supervision & Inspection Center.

1 Scope

This Standard stipulates the method of using test instrument with a constant rate of elongation (20 mm/min) to determine tensile strength, strain at break, breaking length and tensile energy absorption of paper and board. It also stipulates the calculation

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are

applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

3 Terms and Definitions

The following terms and definitions are applicable to this document.

Strain at break refers to the ratio of the elongation at the moment of breaking to the initial test length under the specified test conditions.

4 Principle

Use a tensile tester, at a constant rate of elongation, stretch a sample of the specified size to break; record its tensile force. If necessary, record its elongation. If the tensile force and elongation can be continuously recorded, then, strain at break, tensile energy absorption and modulus of elasticity can be determined.

5 Instruments

It is only needed when the modulus of elasticity needs to be determined.

NOTE. some tensile testers are equipped with the function of drawing the tensile force-elongation curve and calculating the modulus of elasticity without external connection with the above-mentioned devices.

6 Adjustment and Calibration of Tester

In the chuck, clamp a thin aluminum foil; measure the distance between the two clamping indentations; check whether the test length is accurate.

7 Sample Preparation and Processing

In accordance with GB/T 450, take samples.

If tensile index or tensile energy absorption index needs to be determined, then, in accordance with the stipulations of GB/T 451.2, determine the quantification of the samples.

8 Test Procedures

Start the test, till the sample breaks. Then, record the applied maximum tensile