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

GB/T 19789-2021

**Packaging materials Plastic film and sheet oxygen permeability
test Coulometric method**

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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 of Standardization Documents" drafted.

This document replaces GB/T 19789-2005 "Coulomb Counter Test Method for Oxygen Permeability Test of Plastic Films and Sheets of Packaging Materials",

Compared with GB/T 19789-2005, except for structural adjustment and editorial changes, the main technical changes are as follows.

--- Changed the description of the test method in the scope (see Chapter 1, Chapter 1 of the.2005 edition);

--- Delete the normative reference document "GB/T 2918 Standard Environment for Conditioning and Testing of Plastic Specimens" (see the.2005 edition of chapter 2);

--- Deleted the terms steady state, oxygen permeation rate, oxygen permeation constant and definition, added the term oxygen permeation coefficient and definition, and modified

- the term oxygen transmission rate and its definition (see Chapter 3, see Chapter 3 of the.2005 edition);

--- Changed the laboratory environmental conditions (see 6.2, 6.2 of the.2005 edition);

--- Changed the schematic diagram of the tester and included it in the informative Appendix C (see Figure C.1 in Appendix C, Figure 1 of the.2005 edition);

--- Changed the test procedure (see Chapter 9, Chapter 8 of the.2005 edition);

--- Changed the calculation formula of test results (see Chapter 10, Chapter 9 of the.2005 edition).

This document uses the redrafted method to modify the ISO 15105-2:2003 "Test method for gas permeability of plastic films and sheets"

Part 2. The Isobaric Method.

Compared with ISO 15105-2:2003, this document has many adjustments in structure. For the comparison list of chapter numbers between the two documents, see the appendix

Record A.

Compared with ISO 15105-2:2003, this document has many technical differences. For a list of these technical differences and their reasons, see the attachment

Record B.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document specifies the test principles, samples, and samples of the oxygen permeability of packaging materials such as plastic films and sheets by the coulometric test method.

State conditioning and test environment, instruments and materials, diffusion conditions, test procedures, result calculation, test results, and test reports.

This document applies to the oxygen permeability of packaging materials such as plastic films, sheets, composites, paper-plastic composites, and plastic-coated fabrics.

test.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 6672-2001 Plastic film and sheet thickness determination mechanical measurement method (ISO 4593:1993, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

O₂GTR

Under the unit oxygen partial pressure difference between the two sides of the plastic material, the amount of oxygen permeating the unit area of the material per unit time.

3.2

Oxygen transmission rate per unit thickness of material.

4 Test principle

Clamp the test sample in the penetration chamber of the tester (see Figure C.1 in Appendix C), so as to form a tight space between the penetration chambers A and B.

closed barrier layer. Oxygen was introduced into chamber A, and nitrogen carrier gas was introduced into chamber B to slowly purge chamber B. The total pressure in each chamber is equal (ambient

Atmospheric pressure), due to the high partial pressure of oxygen in cavity A, the oxygen in cavity A permeates the sample and enters into cavity B, along with the nitrogen carrier gas.

The chemical reaction is carried out into the coulomb counter sensor and a voltage is generated, which is proportional to the amount of oxygen passing through the coulomb counter per unit time.

Through the calculation of the test results, the oxygen transmission rate and transmission coefficient of the sample are obtained.

5 samples

5.1 The sample shall be representative, free from wrinkles, creases, pinholes and other defects, and shall be uniform in thickness. The area of each sample should be larger than that measured by the tester