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

**GB/T 44824-2024**

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**Biaxial stretching polylactic acid film**

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### 1 Scope

GB/T 44824-2024 specifies biaxially oriented polylactic acid film. BOPLA is the compostable answer to BOPP: made from a plant-derived polyester, oriented in both directions for strength and clarity, and used for food wrapping, labels and window patches where the pack is meant to be composted rather than recycled. Its weaknesses are exactly where the standard has to bite, since PLA softens near 60 degrees and hydrolyses in warm humid storage, so shelf life and heat resistance are the properties a buyer must be able to check. The standard sets the product classification, the technical requirements, the test methods, the inspection rules and the marking, packaging, transport and storage provisions, covering both general purpose and heat-sealable grades. It takes effect on 1 May 2025.

This document specifies the product classification, technical requirements, inspection rules, marking, packaging, transportation and storage of biaxial stretching polylactic acid films, and describes the corresponding test methods. This document applies to both general-purpose and heat-sealing films made primarily from polylactic resin through biaxial stretching using the flat film method.

### 2 Normative References

The contents of the following documents constitute indispensable clauses of this document

through the normative references in the text. 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.

GB/T 1040.3-2006 Plastics - Determination of Tensile Properties - Part

### 3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

### 4 Product Classification

Based on whether a heat-sealing layer is present on the surface, products are classified into ordinary type (Class A) and heat-sealing type (Class B).

#### 5.1 Appearance Requirements

5.1.1 Appearance of film roll The appearance quality of the film roll shall meet the requirements in Table 1.

5.1.2 Film appearance The film surface shall be free of obvious cracks, stains, impurities, and other defects that would affect its use.

#### 5.2 Dimensional Deviations

5.2.1 Width deviation The width deviation is 1 mm ~ 4 mm.

5.2.2 Thickness deviation The thickness limit deviation and average thickness deviation shall meet the requirements of Table 2.

### 6 Test Methods

6.1 Sampling Method The sampled film roll shall be freshly rolled or already packaged. If packaged, the packaging shall be intact. Remove the surface 5 layers from the film roll, cut approximately 20 layers along the width of the roll, and test for appearance, dimensional deviation, and physical and mechanical properties.

6.2 Standard Environment for Specimen Conditioning and Testing Comply with the standard environment and normal deviation range specified in GB/T 2918. Under the temperature of (23 ± 2) °C and relative humidity of (50 ± 10)%, the conditioning time is not less than 4 hours, and the test shall be conducted under these conditions.

6.3 Appearance The film roll shall be visually inspected under natural light or a 40 W fluorescent lamp. Use a steel ruler with a division value of

0.5 mm to measure the misalignment of the film roll end faces.

**6.4 Width Deviation** In accordance with the provisions of GB/T 6673, conduct the measurement.

**6.5 Thickness Deviation** The thickness shall be measured in accordance with the provisions of GB/T 6672. When sampling, the top and bottom layers shall be removed, and the thickness shall be measured using a single sheet of the middle layer. The limit deviation of thickness shall be calculated in accordance with Formula (1), and the average thickness deviation shall be calculated in accordance with Formula (2). Where,  $d$

- the thickness limit deviation;  $d_{\max}$  or  $d_{\min}$
- the maximum or minimum thickness, expressed in (mm);  $d_0$
- the nominal thickness, expressed in (mm).  $d_{\max}$  or  $d_{\min}$  Where,  $d$
- the average thickness deviation;  $d_n$
- the average thickness, expressed in (mm);  $d_0$
- the nominal thickness, expressed in (mm).

**6.6 Tensile Strength and Nominal Tensile Strain** Comply with the provisions of GB/T 1040.3-2006. The specimen is Type 2, and a long strip 150 mm long and (15  $\pm$  0.1) mm wide, with a clamp spacing of 100 mm, and a test speed of (100  $\pm$  10) mm/min.

**6.7 Thermal Shrinkage Rate** Comply with the provisions of GB/T 12027. The determination conditions are (100  $\pm$  1) °C, and the test time is 10 min.

## 6.11 Heat-sealing Strength

**6.11.1 Specimen** Use an A4 sampling plate to take 5 specimens evenly across the entire width of the film.

**6.11.2 Specimen procedures** During the test, fold the specimen in half and align the two ends for heat-sealing. Heat-sealing temperature. 85 °C; heat-sealing pressure. 135 kPa; heat-sealing time. 2 s. The test shall be conducted in accordance with the provisions of GB/T 1040.3-2006. The specimen is Type 2, and a long strip 150 mm long and 15 mm  $\pm$  0.1 mm wide. With the heat-sealed area as the center line, clamp the specimen at both ends onto the two fixtures of the testing machine. The fixture spacing is 100 mm, and the test speed is (100  $\pm$  10) mm/min.

**6.11.3 Result calculation** Take 2 strips from each specimen for the heat-sealing strength test. The result is the arithmetic mean of 10 measurements, and expressed as N/15 mm.

**6.12 Biodegradability** Comply with the provisions of GB/T 41010.

## 7.1 Inspection Classification

**7.1.1 Exit-factory inspection** Exit-factory inspection items include all items in Chapter 5 except for biodegradability.

**7.1.2 Type inspection** Type inspection includes all items in Chapter 5 except for biodegradability. Under any of the following circumstances, type inspection shall be conducted.

- a) During the trial production and type approval of a new product.
- b) After formal production, if there are relatively significant changes in structure, raw materials or processes that may affect product performance.
- c) Annually during normal production.
- d) When production resumes after a six-month suspension.
- e) When the exit-factory inspection results significantly differ from the previous type inspection results.

## **7.2 Sampling and Judgment**

**7.2.1 Batching** The basic unit for product sampling inspection is the roll. A batch consists of 100 tons of films continuously produced under the same process conditions, formula and specifications. When a weekly output is less than 100 t, it is still considered a batch.