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**Quality General Rules of Oxides Barrier Transparent
Plastics Laminated Films and Pouches for Food
Packaging**

食品包装用氧化物阻隔透明塑料复合膜、袋质量通则

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Quality General Rules of Oxides Barrier Transparent Plastics Laminated Films and Pouches for Food Packaging

1 Scope

This Standard specifies the classification, grading, requirements, test methods, inspection rules, packaging, marking, transportation and storage of oxides barrier transparent plastics laminated films and pouches for food packaging.

This Standard is applicable to AlO_x coated biaxially oriented polyester film, SiO_x coated biaxially oriented polyester film and SiO_x coated biaxially oriented polyamide film with top and bottom coatings as the main barrier layer, as well as oxides barrier transparent plastics laminated films and pouches for food packaging made through dry lamination or solvent-free lamination.

This Standard is not applicable to oxides barrier transparent plastics laminated films and pouches for food packaging without top and bottom coatings, and laminated plastic cover films for food packaging.

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.

GB/T 191 Packaging - Pictorial Marking for Handling of Goods

GB/T 1037-1988 Test Method for Water Vapor Transmission of Plastic Film and Sheet - Cup Method

GB/T 1038 Plastics - Film and Sheeting - Determination of Gas Transmission - Differential-pressure Method

GB/T 1040.3-2006 Plastics - Determination of Tensile Properties - Part 3: Test Conditions for Films and Sheets

GB/T 2410-2008 Determination of the Luminous Transmittance and Haze of Transparent Plastics

GB/T 2828.1-2012 Sampling Procedures for Inspection by Attribute - Part 1: Sampling

6 Test Methods

6.1 Specimen Conditioning and Standard Test Environment

In accordance with the standard environment specified in GB/T 2918-2018, conduct the test. The temperature is (23 ± 2) °C and the relative humidity is (50 ± 10) %; the duration of condition is not less than 4 h. In addition, conduct the test under such conditions.

6.2 Sampling

The sampling package shall be intact, and the sampling size shall be sufficient to complete the test items. During the sampling of roll film, remove the three surface layers, then, along the width direction of the roll film, conduct cutting and sampling.

6.3 Appearance Quality

Under natural light, conduct visual inspection. In addition, use a measuring instrument with an accuracy of not lower than 0.5 mm for the measurement.

6.4 Quality of Printing

6.4.1 Quality of intaglio printing

In accordance with the stipulations of GB/T 7707, conduct the test.

6.4.2 Quality of flexographic printing

In accordance with the stipulations of GB/T 17497.2, conduct the test.

6.4.3 Quality of bar code printing

In accordance with the stipulations of GB/T 18348, conduct the test on bar code. For other one-dimensional barcodes, conduct the test in accordance with the stipulations of GB/T 14258.

6.5 Dimensional Deviations

6.5.1 Deviations of length and width

The deviations of length and width shall be tested in accordance with the stipulations of GB/T 6673.

6.5.2 Deviation of thickness

The deviation of thickness shall be tested in accordance with the stipulations of GB/T 6672. The average deviation of thickness shall be calculated in accordance with Formula (1):

$$\Delta \bar{S} = \frac{\bar{S} - S_0}{S_0} \times 100 \quad \dots\dots\dots (1)$$

Where,

$\Delta \bar{S}$ ---the average deviation of thickness, expressed in (%);

$\bar{S}$ ---the average thickness, expressed in (mm);

S_0 ---the nominal thickness, expressed in (mm).

6.5.3 Inner diameter of roll film core

For the inner diameter of the roll film core, use a vernier caliper to measure three values at equal angles on the inner diameter surface of the core; take the arithmetic mean value.

6.5.4 Sealing width of pouches

Use a measuring instrument with an accuracy of not lower than 0.5 mm to measure the sealing width of the pouches.

6.5.5 Distance between seal and edge

Use a measuring instrument with an accuracy of not lower than 0.5 mm to measure the distance between seal and edge.

6.6 Physical and Mechanical Properties

6.6.1 Breaking force and nominal strain at break

In accordance with the stipulations of GB/T 1040.3-2006, conduct the test. Adopt a long specimen, with a length of ≥ 150 mm and a width of 15 mm; the fixture spacing is (100 ± 5) mm; the tensile speed of the specimen (no-load) is (200 ± 20) mm/min.

6.6.2 Peeling force

In accordance with the stipulations of Method A in GB/T 8808-1988, conduct the test.

6.6.3 Heat-sealing strength

In accordance with the stipulations of QB/T 2358-1998 (2009), conduct the test. The heat-sealing conditions are: heat-sealing pressure is 0.35 MPa; heat-sealing duration is 1 s; heat-sealing temperature shall be determined by the demand-side and the supply-side through negotiation. The test direction: for the roll film type, test the longitudinal and horizontal directions; for the pouch type, test each sealed edge.

6.6.4 Oxygen transmission rate

In accordance with the stipulations of GB/T 1038 or GB/T 19789, conduct the test. During the test with the differential-pressure method, the content contact surface faces the low-pressure side of oxygen or the low-concentration side of oxygen.

GB/T 19789 is the arbitration method.

6.6.5 Water vapor transmission rate

In accordance with the stipulations of Method A in GB/T 1037-1988 or GB/T 26253, conduct the test. During the test, the content contact surface faces the low-pressure side of water vapor or the low-concentration side of water vapor; the test temperature is $(38 \pm 0.6) ^\circ\text{C}$ and the relative humidity is $(90 \pm 2)\%$.

GB/T 26253 is the arbitration method.

6.6.6 Anti-rubbing performance

In accordance with Method D of ASTM F392/F392M-M(2015), conduct the test. After the film and pouch are placed still under the standard environment for 24 h, from the film and pouch, cut a 200 mm $\times$ 280 mm rectangular specimen. Fix the width direction of the specimen on the fixture; start to rotate and rub it at a uniform speed; the conditions of the rubbing are as follows:

- a) Frequency of rubbing: 45 times/min;
- b) Angle of rubbing: 440° ;
- c) Linear movement stroke: 155 mm;
- d) Number of rubbings: 20 times.

After the rubbing is completed, horizontally flatten the specimen. The oxygen transmission rate shall be tested in accordance with the stipulations of 6.6.4; the water vapor transmission rate shall be tested in accordance with the stipulations of 6.6.5.

6.6.7 Pressure resistance of pouches

6.6.7.1 Test device

See the test device of pressure resistance of the pouches in Figure 1.

are disqualified items in the inspection results, double specimens shall be taken from the batch for a re-inspection of the disqualified items. If there are still disqualified items, then, it shall be determined as non-conforming to this Standard.

7.3.4 Qualification determination of batch

If the batch is qualified in all the requirements of appearance quality, printing quality, and physical and mechanical properties, then, it shall be determined as conforming to this Standard.

7.4 Exit-factory Inspection Items

Conduct exit-factory inspection on each batch of products. The inspection items are: appearance quality, printing quality, dimensional deviations, peeling force and heat-sealing strength.

7.5 Type Inspection

Type inspection items are all items specified in Chapter 5. Except for water vapor transmission rate, oxygen transmission rate, pressure resistance of pouches, drop performance and heat resistance of pouches, which shall receive type inspection every 3 months, the type inspection shall also be conducted under one of the following circumstances:

- a) In the trial production and appraisal of new products;
- b) When there are relatively significant changes in raw materials and processes that may affect product performance;
- c) When the production has been suspended for more than half a year, and then, resumed;
- d) When there are relatively significant differences between the exit-factory inspection results and the previous type inspection;
- e) When it is requested by a national supervision institution;
- f) During normal production, it shall be carried out once a year.

If all the type inspection items are qualified, the type inspection shall be determined as conforming to this Standard. If there are disqualified items in the type inspection, re-sampling is allowed for a re-inspection. After the re-inspection, if there are still disqualified items, then, the type inspection shall be determined as non-conforming to this Standard.

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