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Adhesives in Food Packaging Materials and Containers

食品包装材料和容器用胶粘剂

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Foreword

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

This Standard was proposed by the China Petroleum and Chemical Association.

This Standard shall be under the jurisdiction of the National Standardization Technical Committee on Adhesives (SAC/TC 185).

The drafting organizations of this Standard: China National Institute of Standardization, Hong Fenghang Chemical (Shenzhen) Co., Ltd., Beijing Huateng High-tech Corp., Beijing Eastern Acrylic Chemical Technology Co., Ltd., Shanghai Banzan Macromolecule Materials Co., Ltd., Shanghai Institute of Rubber Products.

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Adhesives in Food Packaging Materials and Containers

1 Application Scope

This Standard specifies the terms and definitions, classification, specifications, test methods, inspection rules, and marking, packaging, transportation and storage.

This Standard applies to the production, management and testing of adhesives in food packaging materials and containers.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this Standard.

GB/T 1633, *Plastics – Thermoplastic Materials – Determination of Vicat Softening Temperature (VST)*

GB/T 2791, *Adhesives – T Peel Strength Test Method for a Flexible-to-flexible Test Sample Assembly*

GB/T 2793, *Test Method for Nonvolatile Content of Adhesives*

GB/T 2794, *Determination for Viscosity of Adhesives – Single Cylinder Rotational Viscometer Method*

GB/T 2943, *Terms of Adhesive*

GB/T 3682, *Determination of the Melt Mass-Flow Rate (MFR) and the Melt Volume-Flow Rate (MVR) of Thermoplastics*

GB/T 8170, *Rules of Rounding off for Numerical Values and Expression and Judgement of Limiting Values*

GB 9685, *Hygienic Standards for Uses of Additives in Food Containers and Packaging Materials*

GB/T 14518, *Determination of the pH of Adhesives*

GB/T 15332, *Determination of the Softening Point of Hot-melt Adhesives – Ball and Ring Method*

GB/T 20740, *Adhesive – Sampling*

GB/T 30778, *Polyvinyl Acetate-acrylate Emulsion Adhesive for the Laminating of Paper/polymer Films at Room Temperature*

HG/T 3075, *The Specification for Package, Mark, Transportation and Storage of Adhesive Products*

HG/T 3660, *Testing Methods for Melt Viscosity of Hot-melt Adhesives*

HG/T 4362, *Water-based Laminating Adhesive Used in Paper with Polymer Films by Heating Process*

JJF 1070, *Rules of Metrological Testing for Net Quantity of Products in Prepackages with Fixed Content*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions and those defined in GB/T 2943 apply.

3.1

heat sealing

The technique through which food packaging materials or containers are sealed under heating conditions to achieve certain functions.

3.2

cold sealing

The technique through which food packaging materials or containers are sealed under the conditions of normal temperature to achieve certain functions.

4 Classification of Adhesives

4.1 In accordance with the dispersion media, the adhesives in food packaging materials and containers mainly include solvent-based adhesives, solvent-free adhesives and water-based adhesives.

4.2 In accordance with the purposes, the adhesives in food packaging materials and containers mainly include laminating adhesives, coextrusion adhesives and sealing adhesives.

- a) all test films are transparent films without pollution, printing or coating;
- b) the thickness of PET films is 12 μm and the thickness of PE films is 70 μm ;
- c) no slipping agent of PE films separates out and the surface tension of PE films after the corona treatment $\geq 38 \text{ mN/m}$.

7.8.2.2 Sample preparation:

- a) dilute and mix up adhesives in accordance with the operating instructions of adhesives;
- b) apply the diluted adhesives uniformly on PET films and control the adhesive applying quantity (dry adhesive quantity) at $2.0 \text{ g/m}^2 \sim 3.5 \text{ g/m}^2$;
- c) dry the PET films applied with adhesives for 2 min at 80°C to make the solvent fully evaporate and laminate PE films through the heating roll at $50^\circ\text{C} \sim 70^\circ\text{C}$;
- d) use heating and pressure composite roll (steel roll to rubber roll, the Shore A hardness of the rubber roll not lower than 85°) to press the laminated film, with the laminating pressure $\geq 1.0 \text{ MPa}$ and the temperature controlled at $55^\circ\text{C} \sim 60^\circ\text{C}$;
- e) the laminated sample is conditioned for 48 h at $50^\circ\text{C} \sim 55^\circ\text{C}$.

7.8.2.3 The peel strength test is conducted as specified in GB/T 2791. The separation speed of the tester is changed from $(100 \pm 10) \text{ mm/min}$ to $(300 \pm 10) \text{ mm/min}$.

7.8.3 Peel strength of solvent-free polyurethane adhesives for laminating

7.8.3.1 Film materials:

As in 7.8.2.1.

7.8.3.2 Sample preparation:

- a) prepare adhesives in accordance with the proportion of two components in accordance with the operating instructions of adhesives and mix up;
- b) apply the adhesives mixed up on PET films on the solvent-free filming machine and control the adhesive applying quantity (dry adhesive quantity) within $1.8 \text{ g/m}^2 \sim 2.2 \text{ g/m}^2$;
- c) press the PET films coated with adhesives and PE films, controlling the temperature of heating roll at $50^\circ\text{C} \sim 65^\circ\text{C}$, and finish laminating after cooling PET/PE laminating films;
- d) conduct curing under the curing conditions specified in the product specifications (at certain temperature and within certain time) of laminated samples and cut into sample strips as standby.

8 Inspection Rules

8.1 Batching and sampling

Inspection is conducted by batch and a batch consists of adhesives of the same material, composition and production process. The sampling quantity is as specified in GB 20740.

8.2 Delivery inspection

8.2.1 Delivery inspection for adhesives for laminating

8.2.1.1 The items of the delivery inspection of water-based adhesives include appearance, pH, nonvolatile content and viscosity.

8.2.1.2 The items of the delivery inspection of solvent-based adhesives include appearance, viscosity and nonvolatile content.

8.2.1.3 The items of the delivery inspection of solvent-free adhesives include appearance and viscosity.

8.2.2 Delivery inspection of adhesives for extrusion

The items of the delivery inspection include appearance, vicat softening temperature and melting rate.

8.2.3 Delivery inspection of adhesives for sealing

8.2.3.1 The items of the delivery inspection of hot melt adhesives include appearance, melting viscosity and softening temperature.

8.2.3.2 The items of the delivery inspection of water-based adhesives include appearance, pH, nonvolatile content and viscosity.

8.3 Type inspection

The type inspection is a full inspection. During normal production, the type inspection shall be conducted each year, as well as in one of the following situations:

- a) when the trial-manufacture of a new product is evaluated;
- b) when there is any significant change in materials or production processes which may influence the product quality;
- c) when production is resumed after a production halt for more than half a year;
- d) when there is significant difference between the results of delivery inspection and those of last type inspection;

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