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General rules of laminated films and pouches for packaging

包装用复合膜、袋通则

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Foreword

This Standard was proposed by China Light Industry Council.

This Standard shall be under the jurisdiction of National Standardization Technical Committee of Plastic Products.

Drafting organizations of this Standard: Composite Film Professional Committee of China Plastics Processing Industry Association, Shanghai People Plastic Printing Factory, Shanghai Zijiang Color-Printing Packaging Co., Ltd., Wuxi Guotai Color-Printing Co., Ltd., Jiangsu Caihua Packaging Group Co., Lianyungang Zhongjin Medicinal Packaging Co., Ltd.

Main drafters of this Standard: Wu Shiming, Gu Hongqing, Cai Mingyu, Gao Xuewen, Yin Qiqian, Wen Xiusong, Zhang Lieyin and Tian Guohong.

This Standard is developed for the first time.

General Rules of Laminated Films and Pouches for Packaging

1 Scope

This Standard specifies the terms, definitions, symbols, abbreviations, classification, requirements, test methods, inspection rules, packaging, transportation and storage of laminated films and pouches for packaging that are made of different materials through different lamination methods.

This Standard applies to laminated films and pouches for food and non-food packaging; it is not applicable to laminated films and pouches for pharmaceutical packaging.

2 Normative references

The articles contained in the following documents have become part of this document when they are quoted herein. For the dated documents so quoted, all subsequent modifications (excluding corrigendum's contents) or revisions made thereafter do not apply to this Standard. However, the parties who reach an agreement according to this Standard are encouraged to study whether the latest versions of these documents may be used. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB/T 191 Packaging - Pictorial marking for handling of goods (GB/T 191-2000, eqv ISO 780:1997)

GB/T 1037-1988 Test method for water vapor transmission of plastic film and sheet - Cup method (neq ASTM E96:1980)

GB/T 1038-2000 Plastics - Film and sheeting - Determination of gas transmission - Differential-pressure method (neq ISO 2556:1974)

GB/T 1410-2006 Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials (IEC 60093:1980, IDT)

GB/T 1040. 3-2006 Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3:1995, IDT)

GB/T 2410-1980 Transparent plastics - Transmissivity and haze test (eqv ASTM D1003:1977)

GB/T 2918-1998 Plastics - Standard atmospheres for conditioning and testing (idt ISO 291:1997)

GB/T 5009.60-2003 Method for analysis of hygienic standard of products of

polyethylene, polystyrene and polypropyrene for food packaging

GB/T 5009.119-2003 Determination of diaminomethylbezen of complex for food packaging material

GB/T 6672-2001 Plastics film and sheeting - Determination of thickness by mechanical scanning (idt ISO 4593:1993)

GB/T 6673-2001 Determination of length and width of plastics film and sheeting (idt ISO 4592:1992)

GB/T 7707-1987 The intaglic prints for decorating (neq ISO 5737:1983)

GB/T 8808-1988 Test method for peel force of flexible laminated plastics (neq DIN 53357:1982)

GB/T 8809-1988 Test method for pendulum impact resistance of plastic films (neq ASTM D3420:1984)

GB 9683 Hygienic standard for composite laminated food packaging bag

GB/T 10006-1988 Plastics - Film and sheeting - Determination of the coefficients of friction (idt ISO 8295:1986)

GB 12904-2003 Bar code for commodity (ISO/IEC 15420:2000, NEQ)

GB/T 14257-2002 Location of bar code symbol for commodity

GB/T 14258-2003 Information technology - Automatic identification and data capture techniques - Verification of print quality of bar code symbols (ISO/IEC 15416:2000, MOD)

GB/T 17497-1998 Decorative products by flexo printing

GB/T 18348-2001 Verification of print quality of bar code for commodity (ISO/IEC 15416:2000, NEQ)

QB/T1130-1991 Test method of plastic right-angle tear property

QB/T2358-1998 Test method of heat-seal strength of plastic film packaging bag

3 Terms, definitions, symbols and abbreviations

The following terms, definitions, symbols and abbreviations apply to this Standard.

3.1 Terms, definitions and symbols

3.1.1

Material

Here it refers to different types of resins, plastic films, coated films, paper, aluminum foil, etc.

3.1.2

Lamination method

Dry lamination, wet lamination, wet lamination, extrusion lamination, coextru-lamination, etc.

3.1.3

Laminated films

It is composed of two or more kinds of materials.

3.1.4

Pouch

Pouch that is made through hot-seal method, has longitudinal seam and bottom seam, of which the top is sealed through heat-seal method after filling of contents.

3.1.5

Dry lamination

Laminated film manufacturing method that the adhesive between lamination materials is free of volatile substance (e.g. solvent, etc.) during lamination forming.

Symbol “/dr.” is placed in between English abbreviations of two materials to indicate dry lamination, e.g. BOPP/dr. LDPE.

Symbol “/sf.” is placed in between English abbreviations of two materials to indicate solvent-free lamination, e.g. BOPA/sf. LDPE.

3.1.6

Wet lamination

Laminated film manufacturing method that the adhesive between lamination materials has volatile substance during lamination forming.

Symbol “/wt.” is placed in between English abbreviations of two materials to indicate wet lamination, e.g. PAPER/wt. AL.

3.1.7

Extrusion lamination

Laminated film manufacturing method that an extruder is used to extrude adhesive resin for lamination forming of laminated materials.

Symbol "/ex." is placed in between English abbreviations of two materials to indicate extrusion lamination, e.g. BOPP/ex. LDPE.

3.1.8

Coextru-lamination

Laminated film manufacturing method that two or more extruders are used to extrude same or different materials for coextru-forming by multi-layer die-heads.

Symbol "/co." is placed in between English abbreviations of two materials to indicate coextru-lamination, e.g. PP/co. EVA/co. LDPE.

3.2 Abbreviations

ABS	(Acrylonitrile/Butadiene/Styrene) Copolymer
AS	(Acrylonitrile/Styrene) Copolymer
AL	Aluminum foil
BOPA	Biaxially Oriented Polyamide (Nylon)
BOPET	Biaxially Oriented Polyester (Polyethylene Terephthalate)
BOPP	Biaxially Oriented Polypropylene
CPE	Cast Polyethylene
CPP	Cast Polypropylene
EAA	(Ethylene/Acrylic Acid) Copolymer
EEA	(Ethylene/Ethyl Acrylate) Copolymer
EMA	(Ethylene/Methacrylic Acid) Copolymer
EVA	(Ethylene/Vinyl Acetate) Copolymer
EVOH	(Ethylene/Vinyl Alcohol) Copolymer
HDPE	High Density Polyethylene
LDPE	Low Density Polyethylene

5.2.1 Gravure-printing

Gravure-printing quality shall comply with the provisions of GB/T 7707-1987.

5.2.2 Flexographic printing

Flexographic printing quality shall comply with the provisions of GB/T 17497-199.

5.2.3 Bar code printing

Bar code printing shall comply with the provisions of GB 12904-2003 and GB/T 14257-2002.

5.3 Specifications

5.3.1 Dimensional deviation of flat film

Dimensional deviation of flat film in length is determined by both supplying-demanding sides through negotiation; dimensional deviation in width is ±2 mm; average width deviation is ±10%.

5.3.2 Dimensional deviation of roll film

Width deviation is ±2 mm; thickness deviation is ±10%. When roll film is delivered based on length, its length shall not have negative deviation; when it is delivered based on quality, its quality shall not have negative deviation.

5.3.3 Dimensions and deviation of copper core of roll film

Inner diameter is $\phi 76^{+2}_{0}$ mm or $\phi 152^{+2}_{0}$ mm; special requirements are determined by both supplying-demanding sides through negotiation.

5.3.4 Dimensional deviation of pouches

Dimensional deviation of pouches shall comply with the provisions in Table 3.

Table 3 Dimensional deviation of pouches

Pouch Length/mm	Length Deviation/mm	Width Deviation/mm	Seal Width Deviation/%	Distance from Seal to Pouch-edge/mm
<100	±2	±2	±20	≤4
100~400	±4	±4	±20	≤5
>400	±6	±6	±20	≤6
Note: Average thickness deviation of pouches is ±10%.				

5.4 Physical and mechanical properties

5.4.1 Pulling strength

Classification of pulling strength is shown in Table 4.

Table 4 Classification of pulling strength

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Pulling Strength/(N/15 mm)	>100	100~50	<50~25	<25~5	<5

5.4.2 Elongation at break

Classification of elongation at break is shown in Table 5.

Table 5 Classification of elongation at break

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Elongation at break/%	>1 000	1 000~500	<500~100	<100~10	<10

5.4.3 Right-angle tear properties

Classification of right-angle tear property is shown in Table 6.

Table 6 Classification of right-angle tear property

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Right-angle tear/N	>10	10~1	<1~0.5	<0.5 ~0.3	<0.3

5.4.4 Heat-seal strength

Classification of heat-seal strength is shown in Table 7.

Table 7 Classification of heat-seal strength

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Heat-seal strength/(N/15 mm)	>60	60~30	<30~15	<15~5	<5

5.4.5 Peel strength

Classification of peel strength is shown in Table 8.

Table 8 Classification of peel strength

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Peel strength/(N/15 mm)	>10	10~5	<5~1	<1 ~0.2	<0.2

5.4.6 Puncture strength

Classification of puncture strength is shown in Table 9.

Table 9 Classification of puncture strength

Item	Level 1	Level 2	Level 3	Level 4	Level 5
Puncture strength/N	>30	30~20	<20~10	<10~5	<5

5.4.7 Anti-pendulum impact energy

Classification of anti-pendulum impact energy is shown in Table 10.

range; air temperature is (23±2)°C; relative humidity is (50±10)%; state adjustment time is not les than 4 h; and test is carried out under this condition.

6.2 Appearance quality

Visually test in natural light; and measure with the measuring tool of which the precision is not less than 0.5 mm.

6.3 Printing quality

6.3.1 Gravure-printing quality

Follow the provisions of GB/T 7707-1987.

6.3.2 Flexographic printing quality

Follow the provisions of GB/T 17497-1998.

6.3.3 Bar code printing quality

Bar code for commodity is inspected according to GB/T 18348-2001; all the other one-dimensional bar code is inspected according to GB/T 14258-2003..

6.4 Dimensional deviation

6.4.1 Dimensional deviation of films and pouches in length and width follows the provisions of GB/T 6673-2001.

6.4.2 Thickness deviation of films and pouches follow the provisions of GB/T 6672-2001.

6.4.3 Hot-seal width of pouches is measured by the measuring tool of which the precision is not less than 0.5 mm.

6.4.4 The distance from seal to pouch-edge is measured with measuring tool that the prevision is no less than 0.5 mm.

6.5 Physical and mechanical properties

6.5.1 Pulling strength and elongation at break

Follow the provisions of GB/T 1040.3-2006. Use strip sample; the length is ≥ 150 mm; the width is ≥ 15 mm; gauge length is (100±1) mm; tensile speed (no load) of the sample is (250±25) mm/min.

6.5.2 Right-angle tear property

Follow the provisions of QB/T 1130-1991.

6.5.3 Heat-seal strength

7.3 Other contents of inspection rules follow the provisions of specific product standards.

8 Marking, packaging, transportation and storage

8.1 Marking

Inside and outside packaging of each product shall be accompanied by product qualification certificate, indicating product name, specifications, quantity, batch number, date of manufacture, code of inspector, name of manufacturing plant, plant address, executive standard number, etc.

8.2 Packaging

Films and pouches are generally packaged in paper-carton lined with Kraft paper or thin film; it may also be determined by both supplying-demanding sides through negotiation.

8.3 Transportation

Avoid collision or contacting with sharp objects during transportation; handle gently; avoid exposure to the sun and rain; ensure integrity of packaging and being free of contamination. Marking method shall be carried out according to the provisions of GB/T 191.

8.4 Storage

Products shall be stored in clean, dry, ventilated, suitable-temperature warehouse; avoid sunlight; the distance to heat source is not less than 1m; products shall be reasonably stacked. Product shelf life is one year from the date of manufacture.

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