

JIS

JAPANESE INDUSTRIAL STANDARD

Poly(vinyl chloride) films for agriculture

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Poly (vinyl chloride) films for agriculture

K 6732-1996

1. Scope This Japanese Industrial Standard specifies poly(vinyl chloride) films for outer spreading (hereafter referred to as "outer vinyl film") and poly(vinyl chloride) films for inner spreading (hereafter referred to as "inner vinyl film"), both of which are used for agriculture purpose.

Remarks 1. The standards cited in this Standard are listed as follows.

- JIS B 7503 Dial gauges
- JIS B 7753 Light-exposure and light-and-water-exposure apparatus (Open-flame sunshine carbon-arc type)
- JIS K 6253 Hardness testing methods for vulcanized rubber
- JIS K 6900 Plastics – Vocabulary
- JIS K 7100 Standard atmospheres for conditioning and testing of plastics
- JIS P 8116 Paper and board – Determination of tearing resistance
- JIS Z 8401 Rules for rounding off of numerical values

2. The units and numerical values given in { } in this Standard are based on the traditional units, and appended for informative reference.

2. Definitions For the purpose of this Standard, in addition to the definitions in JIS K 6900, the definitions given below apply.

- (1) outer vinyl film Agriculture vinyl film for covering the roof or wall of such as house used for agriculture, facilities to shelter from rainfall, structure like the tunnel in outdoor, and so on.
- (2) inner vinyl film Agriculture vinyl film used for such as stationary inner spreading, curtain, and tunnel employed inside a glass house or plastic house for agriculture.
- (3) house The facilities, covered with such materials as agriculture vinyl film other than glass, in which workers can make their jobs.
- (4) tackiness The property to stick each other when sheets of agriculture vinyl film are put one upon another.

3. Classification Classification shall be an outer vinyl film and inner vinyl film both of which are for agriculture purpose, and their thickness be as in Table 1.

Table 1. Classification (outer vinyl film and inner vinyl film) and their thickness

Classification	Thickness mm
Outer vinyl film	0.05, 0.075, 0.10, 0.13, 0.15, 0.20
Inner vinyl film	0.05, 0.075

4. Performance When outer vinyl film and inner vinyl film are tested according to 9, the outer vinyl film shall comply with the requirements in Table 2.1, and inner vinyl film in Table 2.2.

Table 2.1. Performance of outer vinyl film

Test item		Thickness mm						Applicable subclause
		0.05	0.075	0.10	0.13	0.15	0.20	
Tensile breaking strength N(kgf)		8 {0.8} min.	12 {1.2} min.	15 {1.5} min.	18 {1.8} min.	22 {2.2} min.	30 {3.0} min.	9.3
Elongation %		180 min.	210 min.	230 min.		240 min.		9.3
Tearing strength	Rectangular tearing strength N(kgf)	1.5 {0.15} min.	2.5 {0.25} min.	3.5 {0.35} min.	4.5 {0.45} min.	5.5 {0.55} min.	7.5 {0.75} min.	9.4.1
	Elmendorf tearing strength N(kgf)	3.0 {0.30} min.	4.0 {0.40} min.	6.0 {0.60} min.	7.5 {0.75} min.	9.0 {0.90} min.	12.0 {1.20} min.	9.4.2
Low-temperature resistance	Low-temperature elongation %	10 min.	12 min.	13 min.				9.5
Accelerated weatherability	Discoloration test	No remarkable yellowing						9.6.3
	Remaining elongation after test %	50 min.			55 min.	60 min.		9.6.4

Table 2.2. Performance of inner vinyl film

Test item		Thickness mm		Applicable subclause
		0.05	0.075	
Tensile breaking strength N(kgf)		7 {0.7} min.	10 {1.0} min.	9.3
Elongation %		150 min.	170 min.	9.3
Tearing strength	Rectangular tearing strength N(kgf)	1.5 {0.15} min.	2.5 {0.25} min.	9.4.1
	Elmendorf tearing strength N(kgf)	2.0 {0.20} min.	3.0 {0.30} min.	9.4.2
Accelerated weatherability	Discoloration test	No remarkable yellowing		9.6.3
	Remaining elongation after test %	40 min.		9.6.4
Tackiness N(gf)		0.35 {35} max.		9.7

Remarks: For stationary inner vinyl film, tackiness doesn't apply to.

5. Dimensions

5.1 Width and length The width and length of outer vinyl film and inner vinyl film shall be as in Table 3.

The minus side tolerance of width and length shall be zero.

Width and length other than those specified in Table 3 may be adopted by agreement between the parties concerned with delivery.

Table 3. Width and length of outer vinyl film and inner vinyl film

Width cm	Length m
135	100
185	
230	
270	
300	
370	

5.2 **Thickness** Sample three test pieces for thickness according to 8.1, measure their thickness at 5 points, which were equidistantly divided widthways, with a dial gauge ⁽¹⁾, and record the readings to the nearest 0.001 mm.

Eliminate 3 larger side readings and 3 smaller side readings out of all readings, average 9 readings to get the average, and obtain the difference between it and each reading. Find the difference between the average and the maximum value and the minimum value in the 9 measured, divide this difference with the average to express by percentage, and make this percentage the tolerance to the average thickness. The thickness for outer vinyl film and inner vinyl film shall comply with those shown in Table 4.1 in case of outer one and those shown in Table 4.2 in case of inner one.

Note ⁽¹⁾ Dial gauge shall be the one (measurable range 1mm or 2mm) specified in JIS B 7503, which has a spindle with a circular flat gauge head of 5 ± 0.01 mm diameter, and has an anvil with a flat surface of at least 30 mm diameter. The anvil shall be perpendicular, equipped with a dial of at least 50 mm diameter and with scales with 0.001 mm interval, and have principally 0.8 N {80 gf} pressure load. Alternatively, gauges with an equivalent precision or higher may be used.

Table 4.1. Thickness and tolerance of outer vinyl film

Thickness mm			0.05	0.075	0.10	0.13	0.15	0.20
Tolerance	Difference between thickness and averaged thickness mm	185 cm width or less	± 0.005					
		More than 185 cm width	± 0.007					
	Tolerance to the averaged thickness %	185 cm width or less	± 20	± 15	± 10	± 8	± 7	± 6
		More than 185 cm width	± 25	± 20	± 15	± 12	± 10	

Table 4.2. Thickness and tolerance of inner vinyl film

Thickness mm			0.05	0.075
Tolerance	Difference between thickness and averaged thickness mm	185 cm width or less	± 0.005	
		More than 185 cm width	± 0.007	
	Tolerance to the averaged thickness %	185 cm width or less	± 20	± 15
		More than 185 cm width	± 25	± 20

6. Appearance Appearance shall be tested as follows.

- (1) Summary Put all the sample for test pieces on a frosted glass plate, radiate them from bottom by an incandescent lamp, investigate them from about 1m above with naked eyes if there is unusualness (as bubbles, unevenness, wrinkles, alien matters, pinholes, and irregular color), and there shall be no unusualness.
- (2) Accuracy Investigate accurately the existence of pinholes and alien matters on the test piece shown in Fig. 2 with the naked eye, and the number of unusual existences shall be 10 or less.

7. Material and processing method Material and processing method shall be as follows.

- (1) Outer vinyl film and inner vinyl film shall be formed as film type from the compound whose main ingredient is poly(vinyl chloride) and plasticizer containing such additives as stabilizer.
- (2) Material shall not contain cadmium compound.
- (3) Outer vinyl film and inner vinyl film shall be transparent or crepe finish.
Otherwise, it may be colored.

8. Preparing method of test pieces

8.1 Sampling method of sample In both cases of outer vinyl film and inner vinyl film, take about 2m long film from inside more than 3 layers of rolled film, and mark the lengthwise direction. Cut three strip-type samples, each having 400mm in width, at upper part, at middle part and at lower part of this large sample, discard widthway both ends by each 100mm, if necessary, as shown in Table 5, and cut off 9 samples for test piece and 3 samples for thickness test as shown in Fig. 1. Keep the remaining rolled film to prepare not-yet-radiated sample to be used at 9.6. The not-yet-radiated sample shall be taken similarly to sample for radiation when the tests at 9.6.3 and 9.6.4 are carried out.

Table 5. Sampling method by width

Width	Less than 135 cm width	135 cm width or more
Sample for measurement	As it is	Central part left after cutting widthways both ends by 100 mm

Remarks: Sampling method of tackiness-test sample for inner vinyl film shall follow the Annex.

8.2 Taking test pieces and their number In both cases of outer vinyl film and inner vinyl film, cut out test pieces according to Table 6 with reference to Fig. 2, from the 9 test-piece samples which have been sampled from each strip-type sample as shown in 8.1.

The dimensions of each test piece for the test of tensile breaking strength and elongation, rectangular tearing strength, Elmendorf tearing strength, and low-temperature elongation, shall follow Fig. 3, Fig. 4, Fig. 5 and Fig. 6.

Remarks: Taking method of test pieces and their number for tackiness test for inner vinyl film shall follow the Annex.

Fig. 1. Example of sampling method of samples

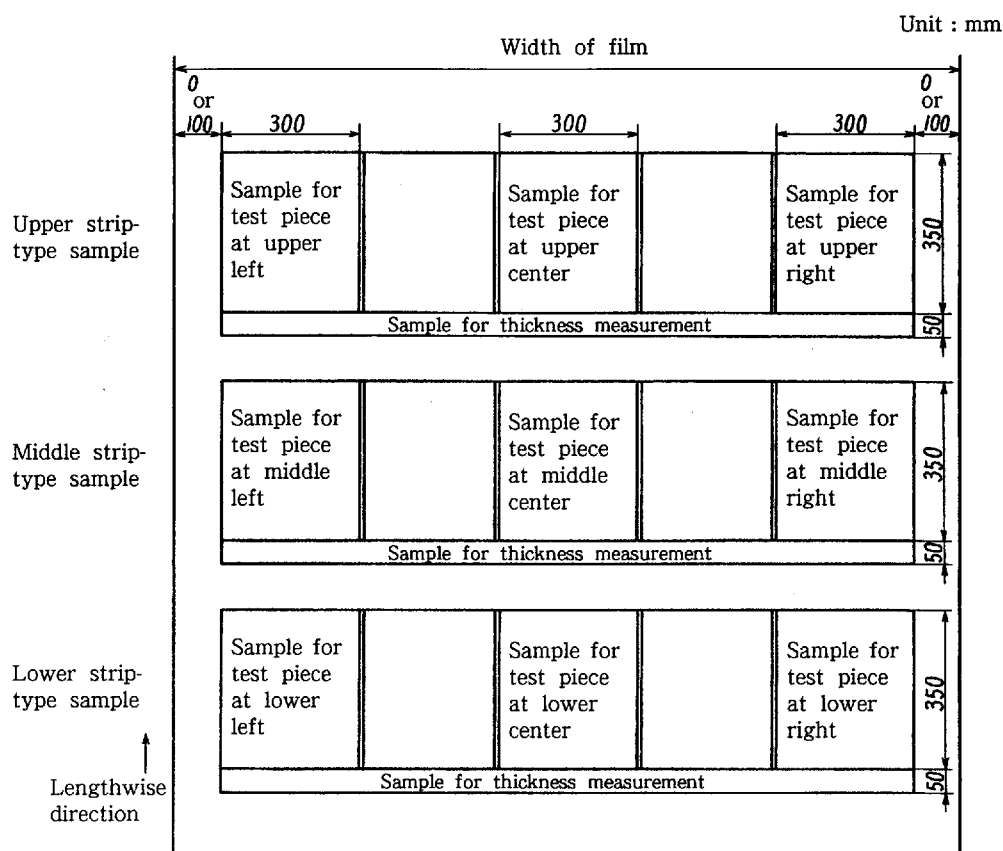


Table 6. Taking method of test pieces and their number

Test item		Taking method of test pieces	Number of test pieces
Appearance	Accuracy test	Take as shown in Fig. 2 from 9 samples for test piece.	9
Tensile test	Breaking strength and elongation		9 pieces each lengthwise and widthwise
Tearing test	Rectangular tearing strength		
	Elmendorf tearing strength		9
Low-temperature resistant test	Low-temperature elongation	Cut out test pieces from 5 samples arbitrarily chosen from 9 test-piece samples as shown the example of Fig. 2.	5
Accelerated weatherability test		Cut out test pieces as shown in Fig. 2 from such 3 test-piece samples which are upper center, middle center and lower center.	3