

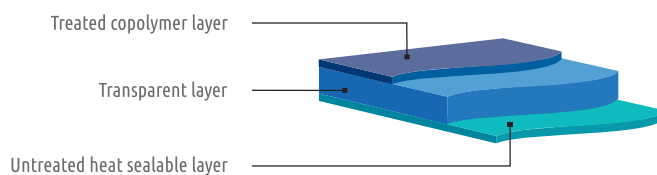


# **BOPP FILMS**

## **TECHNICAL DATA SHEETS**

## Description

**BOPP film transparent,  
heat sealable with medium seal threshold,  
with activation on one side,  
for printing, lamination and packaging**



Properties		Unit	Limit	Method	Value						
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	15	18	20	25	30	35	40
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91						
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	13,65	16,38	18,20	22,75	27,30	31,85	36,40
Tensile strength	MD	N/mm <sup>2</sup> (MPa)	not less	ASTM D882 ISO 527 GOST 14236	130						
	TD				230						
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	220						
	TD				80						
Kinetic coefficient of friction*		UT / UT	-	ASTM D1894 GOST 27492	0,25						
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	5	4					
	TD				3	2					
Heat sealing strength at 115°C, 1 bar, 1 sec*		UT / UT	N/15 MM	not less	ASTM F88/F88M, D882 ISO 527	2,0					
Minimal heat sealing temperature not less than 1N/15mm at 1 bar, 1 sec.*		UT / UT	°C	-	WATERFALL PRO	105					
Haze		-	%	not more	ASTM D1003 GOST R 8.829	3,0					
Gloss		T	%	not less	ASTM D2457	85					
Surface tension**		T	mN/m (dyn/cm)	not less	ASTM D2578 ISO 8296	38					

MD – machine direction  
TD – transverse direction

T – treated side  
UT – untreated side

\* these are typical values, guaranteed for the untreated side only. When processing on both sides, this value is not regulated  
\*\* with double-side treatment (if ordered), the activation of the second side (usually the inside of the roll) is not less than 36 mN/m

### Main characteristics

- low coefficient of friction
- good optical properties
- contains slip-antistatic and anti-block additives

### Application

#### For packing

- different products: food industry, goods for household use, for industrial goods and others
- on the high-speed HFFS and VFFS packaging machines
- with hot (heat sealing) and cold (using cold glue) seal formation
- Flow-Pack
- self using in decorative packaging

#### For lamination

- with other films and materials
- with method of the solvent or nonsolvent (extrusion) lamination

#### For printing

- high-quality rotogravure and flexographic print
- with the use of solvent paint
- method of direct and reverse printing

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 6 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

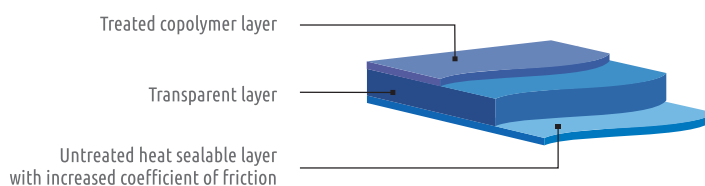
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## Description

**BOPP film transparent, heat sealable with an average sealing threshold, with an increased coefficient of friction, with activation on one side, for printing, lamination and packaging in cases requiring the preservation of bags with products in a single group**



Properties		Unit	Limit	Method	Value						
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	15	18	20	25	30	35	40
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91						
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	13,65	16,38	18,20	22,75	27,30	31,85	36,40
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	130						
	TD				230						
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	220						
	TD				80						
Kinetic coefficient of friction		UT / UT	-	ASTM D1894 GOST 27492	0,45						
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	5	4					
	TD				3	2					
Heat sealing strength at 115°C, 1 bar, 1 sec.		UT / UT	N/15 mm	not less	ASTM F88/F88M, D882 ISO 527	2,0					
Minimal heat sealing temperature not less than 1N/15mm at 1 bar, 1 sec.		UT / UT	°C	-	WATERFALL PRO	105					
Haze		-	%	not more	ASTM D1003 GOST R 8.829	3,0					
Gloss		T	%	not less	ASTM D2457	85					
Surface tension		T	mN/m (dyn/cm)	not less	ASTM D2578 ISO 8296	38					
MD – machine direction TD – transverse direction		T – treated side UT – untreated side									

### Main characteristics

- stable high coefficient of friction
- good optical properties
- contains antistatic and anti-block additives

### Application

#### For packing

- packaging of various products: food industry goods, household goods, industrial goods
- on the high-speed HFFS and VFFS packaging machines
- with hot (heat sealable) and cold (with the help of cold glue) seal formation
- in cases when it is necessary to reduce slip of the flexible package on BOPP film side
- Flow-Pack
- of multiple packs of packaged product with banding method
- in packs, which can stay in single group without sliding on each other

#### For lamination

- with other films and materials, for decreasing influence of slip additives migration on the BOPP film side, which leads to significant reduction of coefficient of friction. In this case high coefficient of friction compensates that.

- using solvent or non-solvent (extrusive) lamination method

#### For printing

- high-quality rotogravure and flexographic print
- with the use of solvent paint
- with the method of direct and reverse printing

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 6 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

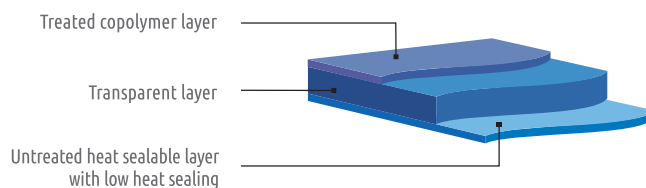
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## Description

**BOPP film transparent,  
heat sealable with a low sealing threshold,  
with activation on one side,  
for printing, lamination and packaging,  
in cases requiring lower heat sealing  
temperatures**



Properties	Unit	Limit	Method	Value					
Thickness	μm	±5%	ISO 4591, 4593 GOST 17035	20	25	30	35	40	
Density	g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91					
Weight m <sup>2</sup>	g/m <sup>2</sup>	±5%	GOST 13199	18,20	22,75	27,30	31,85	36,40	
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	130				
	TD				230				
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	220				
	TD				80				
Kinetic coefficient of friction	UT / UT	-	±0,10	ASTM D1894 GOST 27492	0,25				
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	4				
	TD				2				
Heat sealing strength at 95°C, 1 bar, 1 sec.	UT / UT	N/15 mm	not less	ASTM F88/F88M, D882 ISO 527	2,3				
at 125°C, 1 bar, 1 sec.	T / T								
Minimal heat sealing tem- perature not less than 1N/15mm at 1 bar, 1 sec.	UT / UT	°C	-	WATERFALL PRO	80				
	T / T				115				
Haze	-	%	not more	ASTM D1003 GOST R 8.829	3,0				
Gloss	T	%	not less	ASTM D2457	85				
Surface tension	T	mN/m (dyn/cm)	not less	ASTM D2578 ISO 8296	38				

MD – machine direction  
TD – transverse direction  
T – treated side  
UT – untreated side

### Main characteristics

- low heat sealing temperature
- low coefficient of friction
- good optical properties

### Application

- to reduce the temperature of heat sealing
- to increase the speed of heat sealing
- [For packing](#)
  - on the high-speed HFFS and VFFS packaging machines
  - with hot (heat sealing) seal formed at lower heat sealing temperatures (from 80°C)
- Flow-Pack
- self using in decorative packaging
- [For lamination](#)
  - with other films and materials
  - with method of the solvent or nonsolvent (extrusion) lamination
- [For printing](#)
  - high-quality rotogravure and flexographic print
  - with the use of solvent paint
  - method of direct and reverse printing

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 6 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

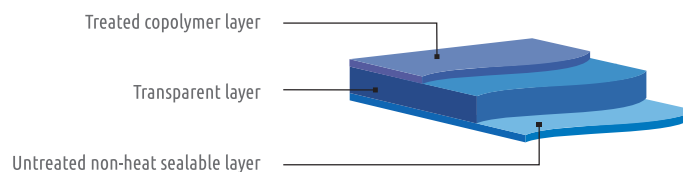
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## Description

**BOPP film transparent,  
non-heat sealable,  
with activation on one side,  
for printing, lamination and production  
of adhesive tapes – scotch tape**



Properties		Unit	Limit	Method	Value															
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	18	20	23	24	25	26	27	28	30	31	32	35	40			
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91															
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	16,38	18,20	20,93	21,84	22,75	23,66	24,57	25,48	27,30	28,21	29,12	31,85	36,40			
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	140															
	TD				250															
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	200															
	TD				70															
Kinetic coefficient of friction*		UT / MT	-	ASTM D1894 GOST 27492	0,35															
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	4															
	TD				2															
Heat sealing strength		-	N/15 mm	ASTM F88/F88M, D882 ISO 527	non-heat sealable															
Minimal heat sealing temperature		-	°C	WATERFALL PRO	non-heat sealable															
Haze		-	%	ASTM D1003 GOST R 8.829	2,0															
Gloss		T	%	ASTM D2457	85															
Surface tension**		T	mN/m (dyn/cm)	ASTM D2578 ISO 8296	38															

MD – machine direction  
TD – transverse direction

T – treated side  
UT – untreated side

\* these are typical values, guaranteed for the untreated side only. When processing on both sides, this value is not regulated  
\*\* with double-side treatment (if ordered), the activation of the second side (usually the inside of the roll) is not less than 36 mN/m

### Main characteristics

- good optical properties – transparency and gloss
- good mechanical properties
- low shrinkable for maintaining print sizes during glue drying

### Application

- use for adhesive tapes production – the scotch with melt and waterborne glues
- self using in decorative package
- [For lamination](#)
- with other films and materials (if necessary)
- with method of the solvent or nonsolvent (extrusion) lamination

#### [For printing](#)

- high-quality rotogravure and flexographic print
- with the use of solvent paint

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 6 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

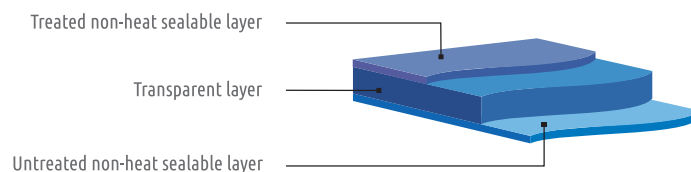
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## Description

**BOPP film transparent,  
non-heat sealable,  
with activation on one side,  
for printing, lamination and  
decorative packaging**



Properties		Unit	Limit	Method	Value						
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	20	23	25	28	30	35	40
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91						
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	18,20	20,93	22,75	25,48	27,30	31,85	36,40
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	140						
	TD				250						
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	200						
	TD				70						
Kinetic coefficient of friction*		UT / UT	-	ASTM D1894 GOST 27492	0,4						
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	4						
	TD				2						
Heat sealing strength		-	N/15 mm	ASTM F88/F88M, D882 ISO 527	non-heat sealable						
Minimal heat sealing temperature		-	°C	WATERFALL PRO	non-heat sealable						
Haze		-	%	ASTM D1003 GOST R 8.829	2,0						
Gloss		T	%	ASTM D2457	85						
Surface tension**		T	mN/m (dyn/cm)	ASTM D2578 ISO 8296	38						
MD – machine direction TD – transverse direction		T – treated side UT – untreated side		* these are typical values, guaranteed for the untreated side only. When processing on both sides, this value is not regulated ** with double-side treatment (if ordered), the activation of the second side (usually the inside of the roll) is not less than 36 mN/m							

### Main characteristics

- high coefficient of friction
- high transparency and gloss
- used as a face film of a package with high gloss

### Application

- for exempting heat sealability on the package front side
- for manual and machine product wrapping (flowers, gifts, office, textile products etc.)

#### For packing

- for exempting heat sealability

#### For lamination

- with other films and materials (if necessary)
- with method of the solvent or nonsolvent (extrusion) lamination

#### For printing

- high-quality rotogravure and flexographic print
- with the use of solvent paint

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 6 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

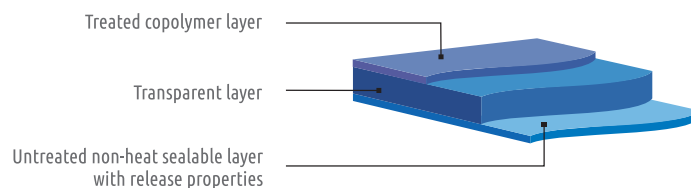
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## Description

**BOPP film transparent,  
with release effect, non-heat sealable,  
with activation on one side,  
for printing, lamination and packaging  
production with cold-welded glue frame**



Properties		Unit	Limit	Method	Value					
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	15	20	25	30	35	40
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91					
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	13,65	18,20	22,75	27,30	31,85	36,40
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	140					
	TD				250					
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	200					
	TD				70					
Kinetic coefficient of friction		UT / UT	-	ASTM D1894 GOST 27492	0,25					
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	5			4		
	TD				2			2		
Heat sealing strength		UT / UT	N/15 mm	ASTM F88/F88M, D882 ISO 527	non-heat sealable					
Minimal heat sealing temperature		UT / UT	°C	WATERFALL PRO	non-heat sealable					
Haze		-	%	ASTM D1003 GOST R 8.829	3,0					
Gloss		T	%	ASTM D2457	85					
Surface tension		T	mN/m (dyn/cm)	ASTM D2578 ISO 8296	38					

MD – machine direction  
TD – transverse direction

T – treated side  
UT – untreated side

### Main characteristics

- high release characteristics
- low coefficient of friction
- high transparent

### Application

- for reopening/reclosing of package
- [For packing](#)
- on the HFFS packaging machines
- with cold (using cold glue) seal formation
- with cold glue for one-and reopening
- [For lamination](#)
- with other films and materials
- with method of the solvent or nonsolvent (extrusion) lamination
- [For printing](#)
- high-quality rotogravure and flexographic print
- with the use of solvent paint

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 3 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

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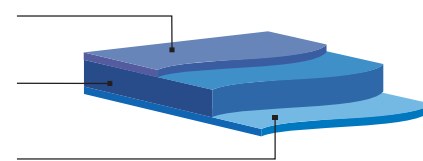
## Description

**BOPP film transparent,  
with antifog effect (anti-fog),  
heat sealable with an average sealing  
threshold, with double-sided activation,  
for printing and packaging products  
in cases requiring no fogging of the packaging  
material**

Treated heat sealable layer (NF)  
for printing

Transparent core layer

Treated heat sealable layer  
with anti-fog properties (F)



Properties		Unit	Limit	Method	Value				
Thickness		μm	±5%	ISO 4591, 4593 GOST 17035	20	25	30	35	40
Density		g/cm <sup>3</sup>	±10%	WATERFALL PRO	0,91				
Weight m <sup>2</sup>		g/m <sup>2</sup>	±5%	GOST 13199	18,20	22,75	27,30	31,85	36,40
Tensile strength	MD	N/mm <sup>2</sup> (Mpa)	not less	ASTM D882 ISO 527 GOST 14236	130				
	TD				230				
Elongation at break	MD	%	not more	ASTM D1894 GOST 27492	220				
	TD				80				
Kinetic coefficient of friction	NF / NF	-	±0,10	ASTM D1894 GOST 27492	0,25				
	F / F								
Shrinkage at 120°C, 5 min	MD	%	not more	ASTM D1204	5		4		
	TD				2		2		
Heat sealing strength at 130°C, 1 bar, 1 sec		NF / F	N/15 mm	not less	ASTM F88/F88M, D882 ISO 527	2,3			
Minimal heat sealing temperature not less than 1H / 15mm at 1 bar, sec.		NF / F	°C	-	WATERFALL PRO	120			
Haze		-	%	not more	ASTM D1003 GOST R 8.829	3,2			
Gloss		NF	%	not less	ASTM D2457	85			
Surface tension		NF	mN/m (dyn/cm)	not less	ASTM D2578 ISO 8296	38			
Anti-fogging level in cold fog conditions (anti-fog properties)		F	point	not less	WATERFALL PRO	4			

MD – machine direction  
TD – transverse direction

NF – non-functional side (for printing)  
F – functional side (with antifog property)

### Main characteristics

- good anti-fog properties from + 4°C and above
- low coefficient of friction
- one side has anti-fog properties
- the other side is for printing

### Application

- for packaging products which require no fogging, contributing to the preservation of the basic properties of perishable products: fresh vegetables, salads, fruits, hot food, semi-finished products of flour products (dough), etc.

#### For packing

- on the high-speed HFFS and VFFS packaging machines
- with hot (heat sealing) seal formation
- Flow-Pack

#### For lamination

- with other films and materials (the change in anti-fog properties after lamination was not studied)
- with method of the solvent lamination

#### For printing

- high-quality rotogravure and flexographic print
- with the use of solvent paint
- method of direct printing

### Storage

- films should be stored on the pallets in a closed dry place and should not be exposed to direct sunlight, at a safe distance of not less than 1 m from heating devices or anything that can cause damage the package
- the film should be kept in workplace not less than 48 hours before being used
- guaranteed storage period – 6 months from production date

### Treatment

- the guaranteed period for maintaining the minimum permissible level of surface tension on the activated film surface from the date of manufacture, subject to proper storage conditions, is 3 months
- in the interests of minimizing the deterioration of surface dressing level, it is recommended to store the film at a temperature of no higher than 30°C and use it in a short time

### Recycling

- in the process of printing and lamination it is recommended to perform corona treatment

### Reeling

- maximum roll diameter 800 mm
- film width in a roll from 290 to 2000 mm
- diameter of paper cores (inside) 76, 152 mm

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