

Caralyan®Y

An easy-to-open film created with DENKA's own film technology.

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Denki Kagaku Kogyo K.K.

Caralyan®Y uses high-density polyethylene materials, making it a well-suited film for lamination due to its traverse direction (TD) mono-axial cut properties.

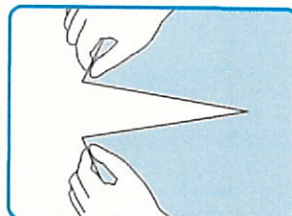
Plastic film stretching technology is generally used to improve physicality such as transparency, gas barrier qualities, shock resistance, pulling strength and gloss levels. At DENKA, we have created a polyethylene film with its T units, and established a technology to direct elements by stretching the traverse direction. With this unique technology, DENKA is creating high value-added products.

● Caralyan Y conforms to certification standards for food additives, etc. of the Food Sanitation Law (Ministry of Health Bulletin, No. 370, 1959).

Feature

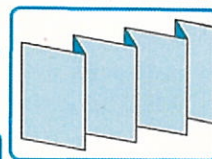
1. Excellent lateral (TD) mono-axial cut properties

It can be easily torn across a single axis in a traverse direction and has excellent mono-axial cut properties, which are evident even in multi-layer materials such as AL, NY, OPP, PET or Sello.



2. Strength across TD orientation

Since Caralyan®Y is strong across the TD orientation, it has excellent upright-bearing qualities.



3. Outstanding Twistability Characteristics...

Its outstanding twistability characteristics make it ideal for many uses including candy wrappers.



4. Excellent moisture-proof qualities, tensile strength, stretchable qualities and shock resistance

Caralyan®Y has excellent moisture-proof qualities, tensile strength, stretching qualities and shock resistance when compared to Low Density Polyethylene (hereafter LDPE).

5. Can be used with in-line processes

Generally, the mono-axial cut qualities cannot be added to the traverse direction with horizontally stretching films with in-line packaging processes, resulting in off-line packaging manufacture. However, since Caralyan®Y has mono-axial cut qualities across the traverse direction (TD), it can be used with in-line processes without any problems.

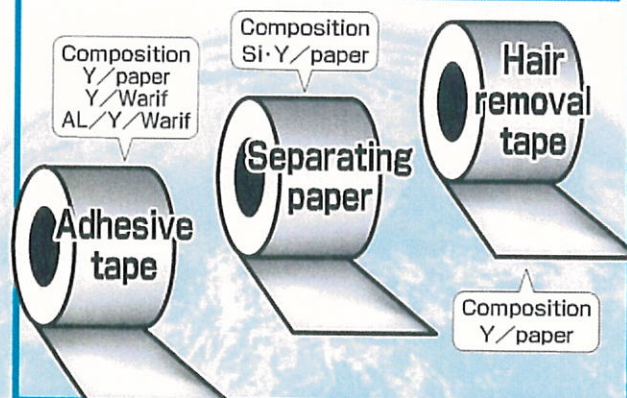
6. Broad range of uses

Caralyan®Y is heat resistant to 80°C and cold resistant to -30°C. Since thermal shrinkage can occur rapidly around 120°C, please exercise caution with processing times and temperatures. Due to the nature of high-density polyethylene, the strength of heat seals is weaker than usual; however, good seals are possible by layering heat seal resins (CP/LD).

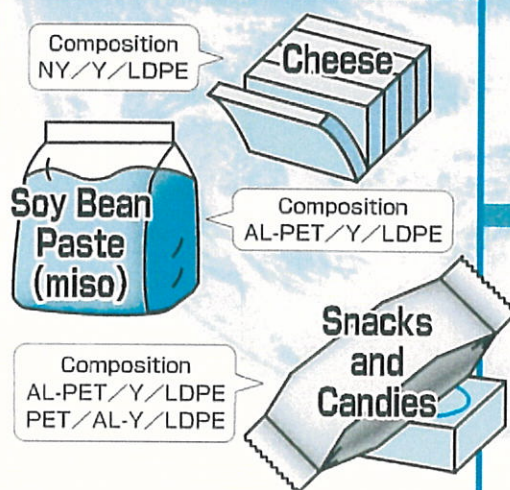
7. Easy laminate processing

Caralyan®Y is suitable for composite materials and lamination of most materials such as laminates and dry laminates extracted with PE, PET, AL, NY, paper, OPP and EVA is possible. It can also be used with either double-sided or single-sided corona processing.

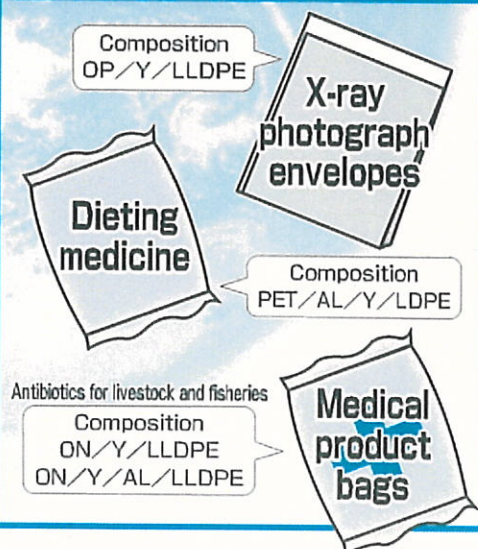
Packaging Materials



Foodstuffs



Medical

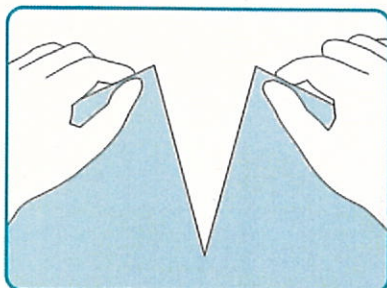


Caralyan[®]Y

Usage 1

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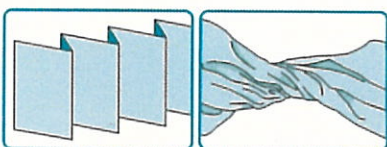
Usage as foodstuff packaging with mono-axial cut properties



Convenience in opening for foodstuffs packaging is a quality being sought out by the industry. Caralyan[®]Y is often used due to its excellent safety properties, aesthetics and workability, and is most suitable for materials that are difficult to cut and tight packaging designs. At DENKA, we provide a film that can contribute to universal designs in packaging for the whole foodstuffs industry.



Usage as foodstuff packaging with twistable properties



Caralyan[®]Y's twistability is put to good use in products such as flower and candy wrappers. As it is print-ready with good film strength, it is highly suitable for use with machinery. We also have a wide range of transparency levels grades to suit all needs and desires.

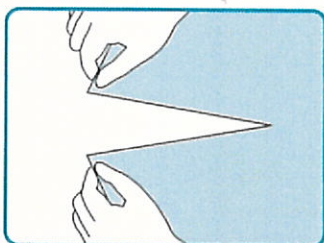


Caralyan®Y

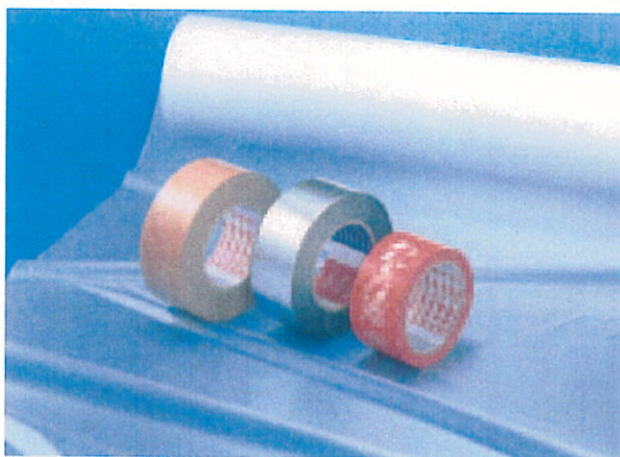
Usage 2

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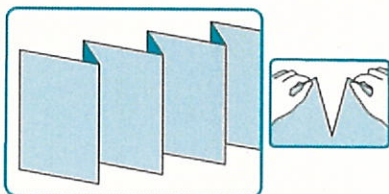
Usage as a laterally-tearable taping



Caralyan®Y is used as a laminating material for a wide range of uses, from packaging taping and protective taping to electrical insulation taping and more. In addition, needs for such material are rising due to the accelerated use of desalinated products brought about by recent environmental issues.



Usage as a paper-laminating device



By laminating paper with Caralyan®Y, prevention of tearing at angles is achieved and mono-axial tearing properties are preserved in a wide variety of products.

In addition, it is also widely used in products with lamination for removable paper and paper bags.



Caralyan[®]Y

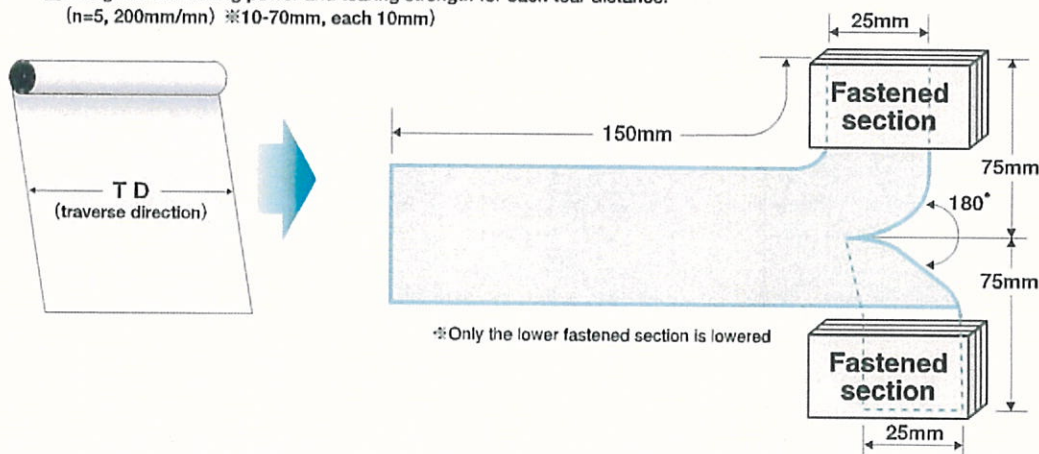
Measurement
Methods

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The performance of Caralyan[®]Y is measured with DENKA's own unique testing.

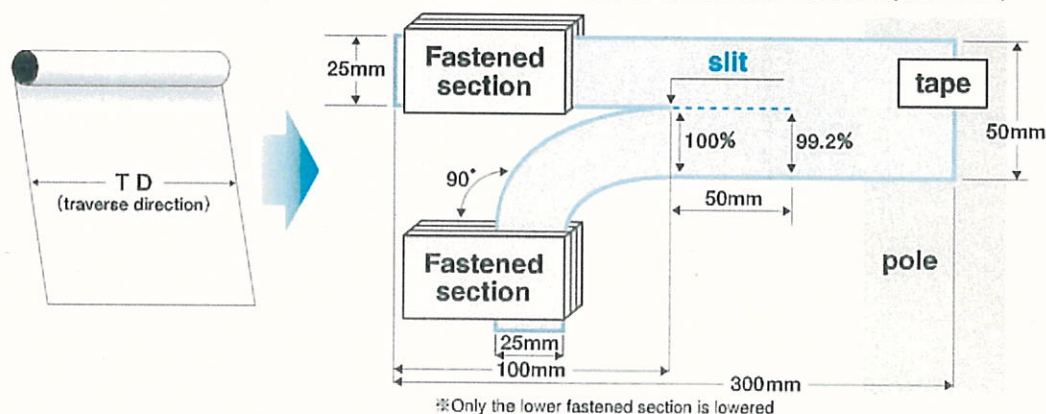
Ease of Tearing Measurement Method

- 1 A 50mm x 150mm piece of Caralyan[®]Y stored for one day at a constant temperature of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 50% humidity $\pm 5\%$ was cut across the TD orientation and a 75mm slit made through the center.
- 2 A width of 25mm on both sides of the slit is pulled back by a resistance testing machine so as to form a 180° angle between the two sides, and fastened.
- 3 This gives the tearing power and tearing strength for each tear distance.
($n=5$, 200mm/mn) ※10-70mm, each 10mm)



Mono-axial Cut Property Measurement Method

- 1 A 50mm x 300mm piece of Caralyan[®]Y stored for one day at a constant temperature of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 50% humidity $\pm 5\%$ was cut across the TD orientation and a 100mm slit made through the center.
- 2 A width of 25mm on one side of the slit is pulled down by a resistance testing machine so as to form a 90° angle between the two sides, and fastened.
- 3 The film base is fixed to a column by adhesive tape.
- 4 The width from the torn portion for each tear distance is measured. ($n=5$, 200mm/mn) ※50-150mm, each 10mm)



Product Name		Caralyan®Y			Measurement Method
Measurement Direction		M D	T D		
Characteristic	S I Unit	Representative			
Thickness	μ m	18			
Breaking strength	MPa	350	2500		JIS Z-1702
Breaking stretch	%	820	14		
Tensile modulus of elasticity	MPa	2120	4570		JIS K-7111
Thermal compression ratio	100℃	%	0.5	1	JIS K-6734 ※1
	110℃		0.5	2	
	120℃		1	6	
Shock resistance	J	40			JIS P8134
Haze	%	50			ASTM D-1003
Gloss	%	90			ASTM D-1003
Gas permeability level	mol/m ² ・s・Pa	1.53×10 ⁻¹¹			JIS K-7126
CO ₂ permeability level	mol/m ² ・s・Pa	6.12×10 ⁻¹¹			JIS K-7126
Water vapor permeability	g/m ² ・24h	8.0			JIS Z-0208
Tearing strength	N	—	0.3		JIS P8116
Ease of tearing	Tearing effort	N	0.015		DENKA method ※2
	Tearing strength	N/mm	0.950		DENKA method ※3
Mono-axial cut properties	Tearing distance (mm)	50	100	150	DENKA method ※4
	Tearing gap (%)	99.2	97.2	90.0	

○The figures on physical properties are measurement values and are not guaranteed values.

※1 : Measurement after free compression during 10 minutes in measurement temperature environment of a Gia oven. (DENKA Method : a unique DENKA measurement based on JIS K-7126)

※2 : Tearing power when torn by an autograph (see JIS K-7126)

※3 : Tearing strength, calculated via dividing tearing power when torn by an autograph by film thickness.

※4 : Mono-axial cut properties when torn at right angles by an autograph.