

OPBT film for Industrial Purpose

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KOHJIN Film & Chemicals

Our OPBT Film Overview

	Pinhole Resistance			Heat Resistance	Cold Resistance	Releasability	Formability		Secondary Processability	Low Elution	
	Impact Strength	Needle Strength	Flexing				Abrasion	Melting Point/Shrinkage under high temp.			Strength in frozen env.
OPBT (15 μ)	⊙	⊙	⊙	⊙	○	⊙	⊙	⊙	○	⊙	⊙
ONY (15 μ)	⊙	⊙	○	○	○	△	△	△	⊙	△	△
OPET (16 μ)	△	△	△	⊙	⊙	⊙	△	△	△	⊙	⊙

✓ We are **the first manufacturer to introduce Biaxially Oriented PBT film** applied by our original Tubular simultaneous biaxially oriented method

✓ **Strong in Pinhole**

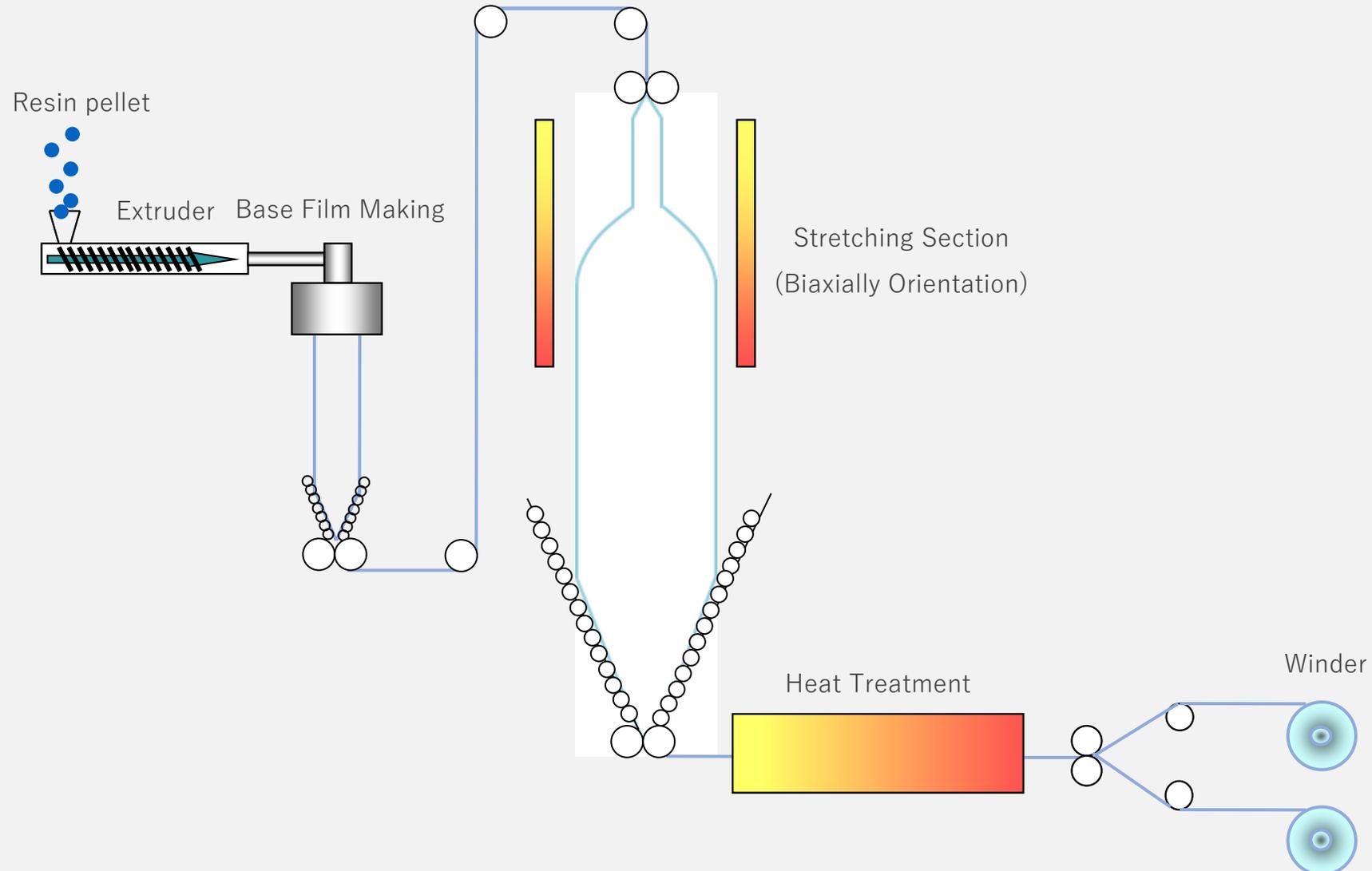
✓ **Excellent Formability** due to our original Tubular method

✓ **Heat/Cold resistance, Secondary Processability, Low Elution**

⊙ : Superior to other ○ : Same as other △ : Inferior to other

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Our Tubular Method



Properties/Applications (for food packaging)

		OPBT	ONY	OPET	NO. Application	Contents	Original Lamination Structure	OPBT Lamination Structure	Reason OPBT being chosen
Thickness (μ)		15	15	16					
Haze (%)		5.4	2.6	2.8	1	Microwave Curries, etc	VMOPET(12)//ONY(15)//CPP	VMOPET(12)//OPBT(15)//CPP	Microwavable
Tensile Strength	MD	210	280	170	2	Retort Curry 200g	OPET(12)//ONY(15)//AL//CPP	OPBT(15)//AL//CPP	Reducing total thickness
	TD	220	300	180					
Impact Strength (J)		1.1	1.5	0.5	3	Packing bag for Heavy Load Red Beans (1~5kg)	OPET(12)//ONY(15)//LL	OPBT(15)//ONY(15)//LL	Pinhole Resistance
Needle Strength (N)		10	11	8					
Gelboflex Test (5°C × 40%RH × 500times)		1	12	120	4	Frozen food Fish cake (1kg)	ONY(25)//LL	OPBT(20)//LL	Pinhole Resistance in frozen env,
Shrinkage in Hot Water 150°C (%)	MD	2.4	0.8	1.4	5	Frozen/Lid Frozen Food	OPET(12)//ONY(15)//LL	OPBT(20)//LL	Reducing total thickness
	TD	0.3	0.8	0.0					
Water Vaper Transmission rate (g/m ² · 24hr)		49	310	42	6	Lids Portion	特殊OPET(25)//PS sheet	OPBT(15)//PS sheet	Formability
Oxygen Transmission Rate (cc/m ² · 24hr)		110	23	81	7	Lids Thermoforming	CPP(40)//barrierONY(15)//EP	OPBT(15)//BarrierONY(15)//EP	Heat resistance, Packaging, Reducing total thickness
					8	Others Konjac	OPET(12)//ONY(15)//LL	OPBT(15)//LL	Reducing total thickness

※23°C × 50%RH

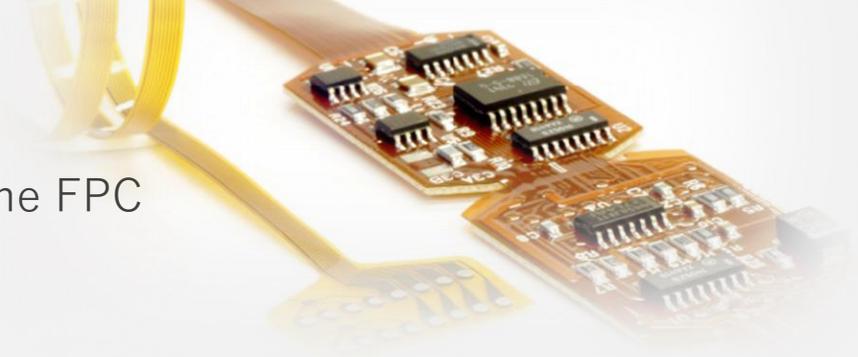
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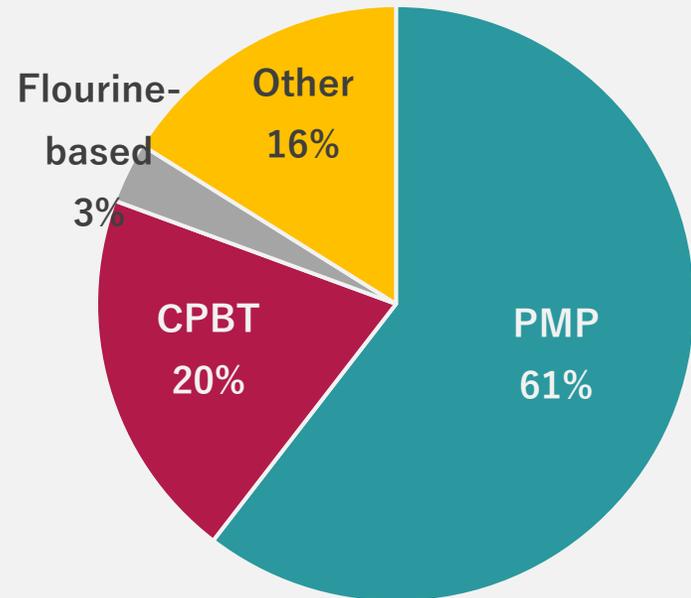
Expected Application① : FPC Release Film

Flexible Printed Circuits

It is the process material to protect the circuit of the coverlay film in the FPC manufacturing process.



Weight of material used



- ✓ **Heat Resistance** during high temp, process
- ✓ **Releasability** from a product after pressing
- ✓ **Irregular Surface Followability**
- ✓ **Low Outgassing Property**

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Reference: 富士キメラ総研 機能性高分子フィルムの現状と将来展望(2015)

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Expected Application① : FPC Release Film

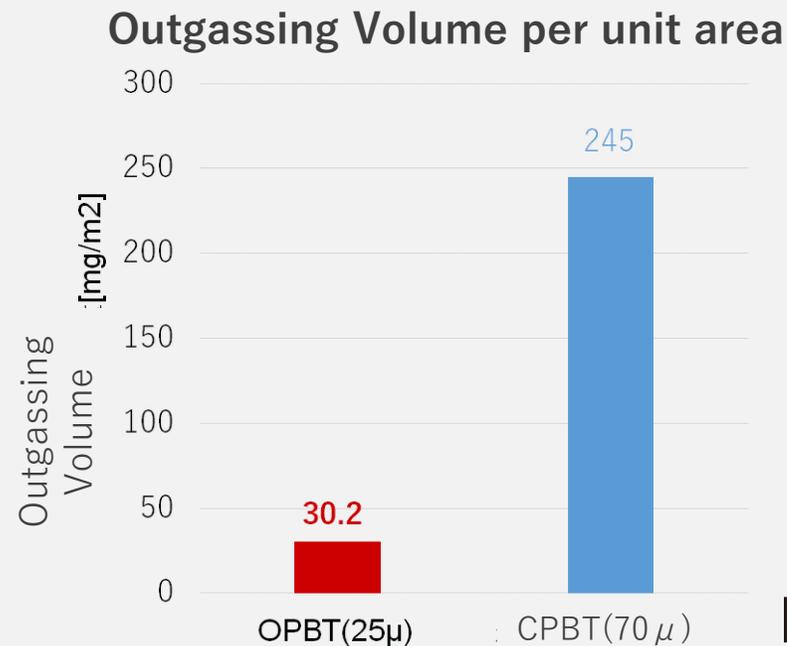
	Heat Resistance	Releasability	Followability	Low Outgassing	Cost	Thickness (μm)
OPBT	○	○	○	◎	○	25(max)
CPBT	○	△~○	◎	○	○	70
PMP	○	◎	◎	△	△	50

<Expected Benefits>

- Low Outgassing
- Stable Procurement
- Reducing Cost(vsPMP)

※Single layer type

Film	Water drop contact angle (°)
OPBT(25μ)	80.9
CPBT(70μ)	60.9
PMP (50μ)	101



Expected Application② : Decorative Transfer Film

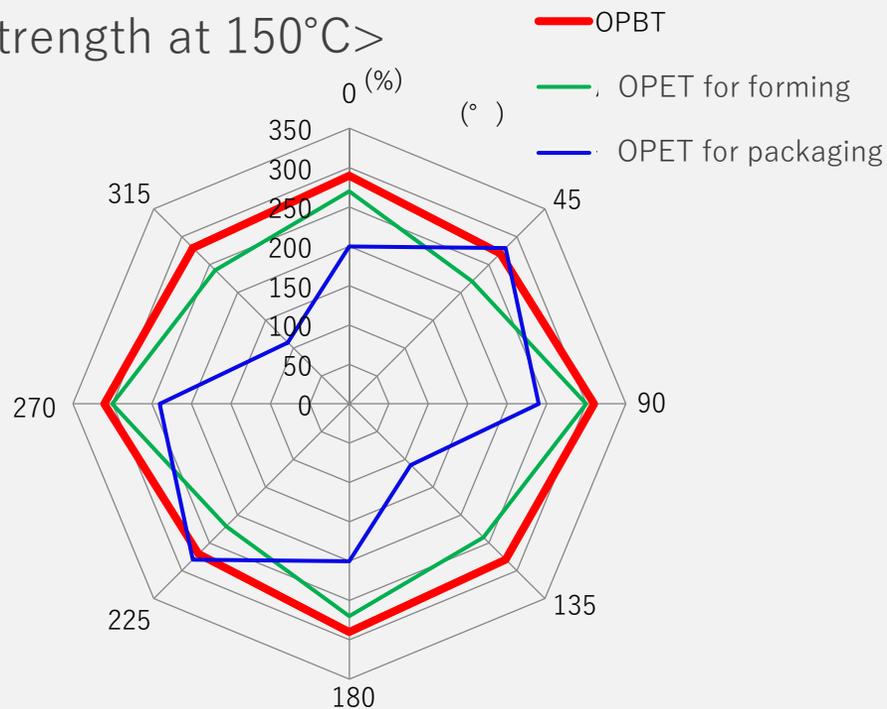
※Under evaluation of decorative transfer film for interior parts of vehicle.

(Reducing CO2 emission by replacing from painting to decorative transfer film)



✓ **Excellent Followability** on curved surface

<Tensile Strength at 150°C>



<Expected Benefits>

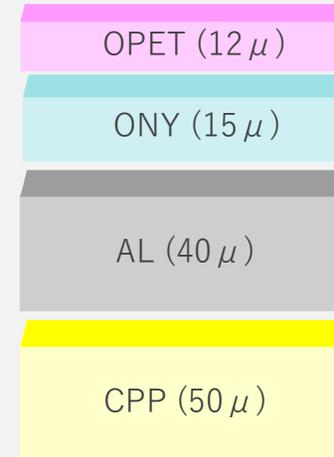
- Improve transferring process
 - ※Being decorative transferring possible on difficult curved surface
- Reducing a total thickness

Expected Application③ : Laminated pouch LIB



※Under evaluation by customers in overseas especially for EV application

- ✓ **Cold Formability** as same level as current product
- ✓ Improve productivity **by Reducing One Lamination**
- ✓ ※Reducing one layer : OPET//ONY→OPBT



	Cold Formability	Productivity	Long-term Reliability	Electrolyte Solution Resistance
OPBT	○	◎	◎	◎
ONY (for 3C)	◎	◎	△	△
OPET//ONY (for EV)	○	△	○	◎

※Lamination Structure for EV

<Expected Benefits>

- Improve Productivity
- Increase long-term reliability

Expected Application④ : Building Material

※Under evaluation on building rooftop construction materials, housing waterproofing materials, frozen internal wall materials, etc

- ✓ **Improve Processability** during construction (moderate flexibility, Strong in pinhole during winter season)
- ✓ **Durability** after construction (heat/cold resistance, oil/chemical resistance, reduction of aging)



	Flexibility	Pinhole Resistance	Heat/Cold Resistance	Oil/Chemical Resistance	Thickness (μm)
OPBT	○	◎	◎	◎	15~25
OPET	△	○	◎	◎	25~70
Olefin Films	◎	△	△	△	15~50

<Expected Benefits>

- Reduction of processing losses
- Improve of durability
- Reducing film thickness

Expected Merits⑤ : Film Laminated Steel Sheet



※Under evaluation on the exterior side of canned reel/cover materials
(Reducing environmental impact by replacement from painting to laminated film)

- ✓ Strong in **Retort Resistance**
- ✓ **Excellent processability** in steel plate thermal lamination process

	Retort Resistance	Processability	Thickness (μm)
OPBT	◎	◎	15
CPBT	◎	△~○	50~70
OPET	△	◎	-

<Expected Benefits>

- Reduction of processing losses
- Reducing film thickness