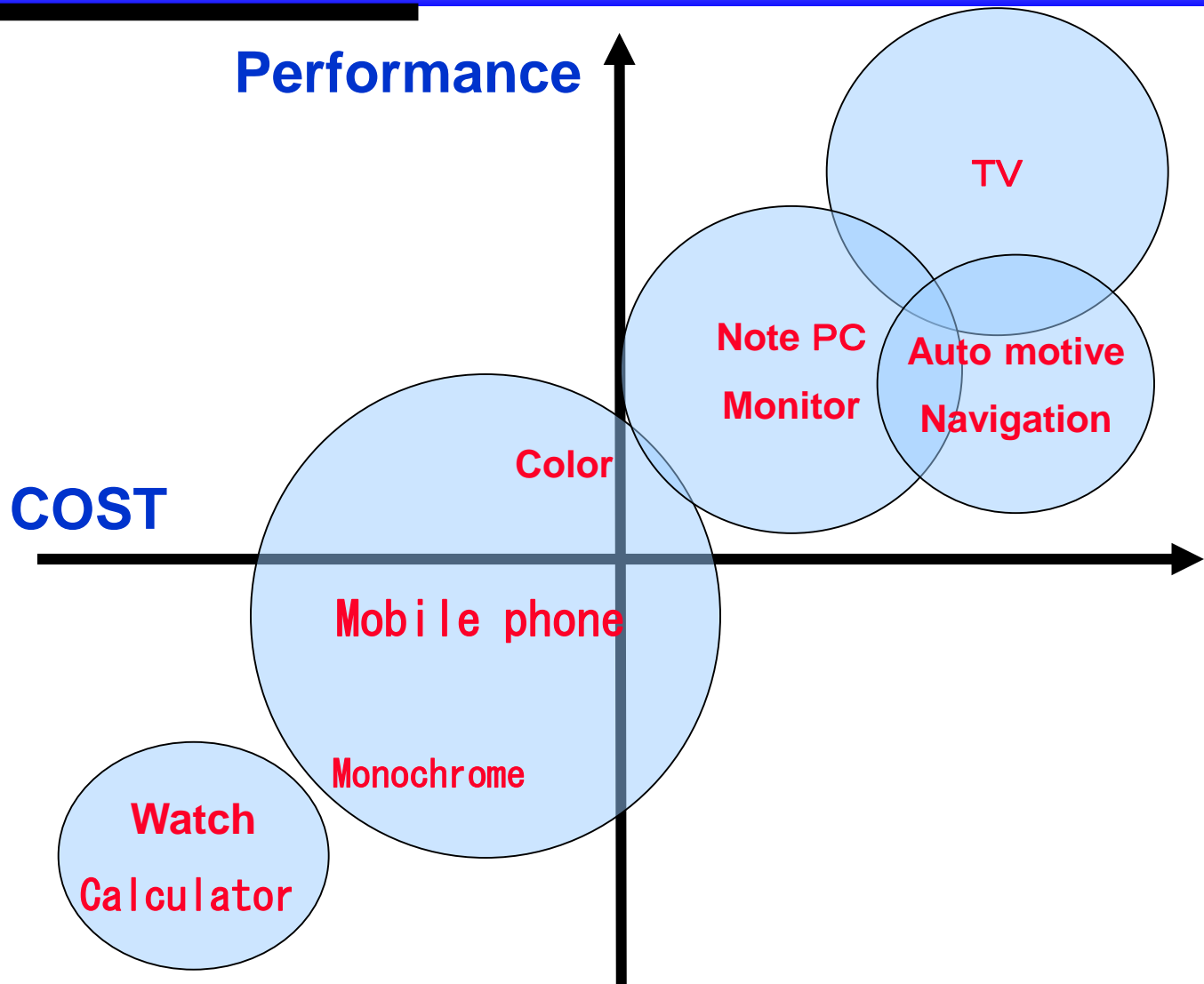


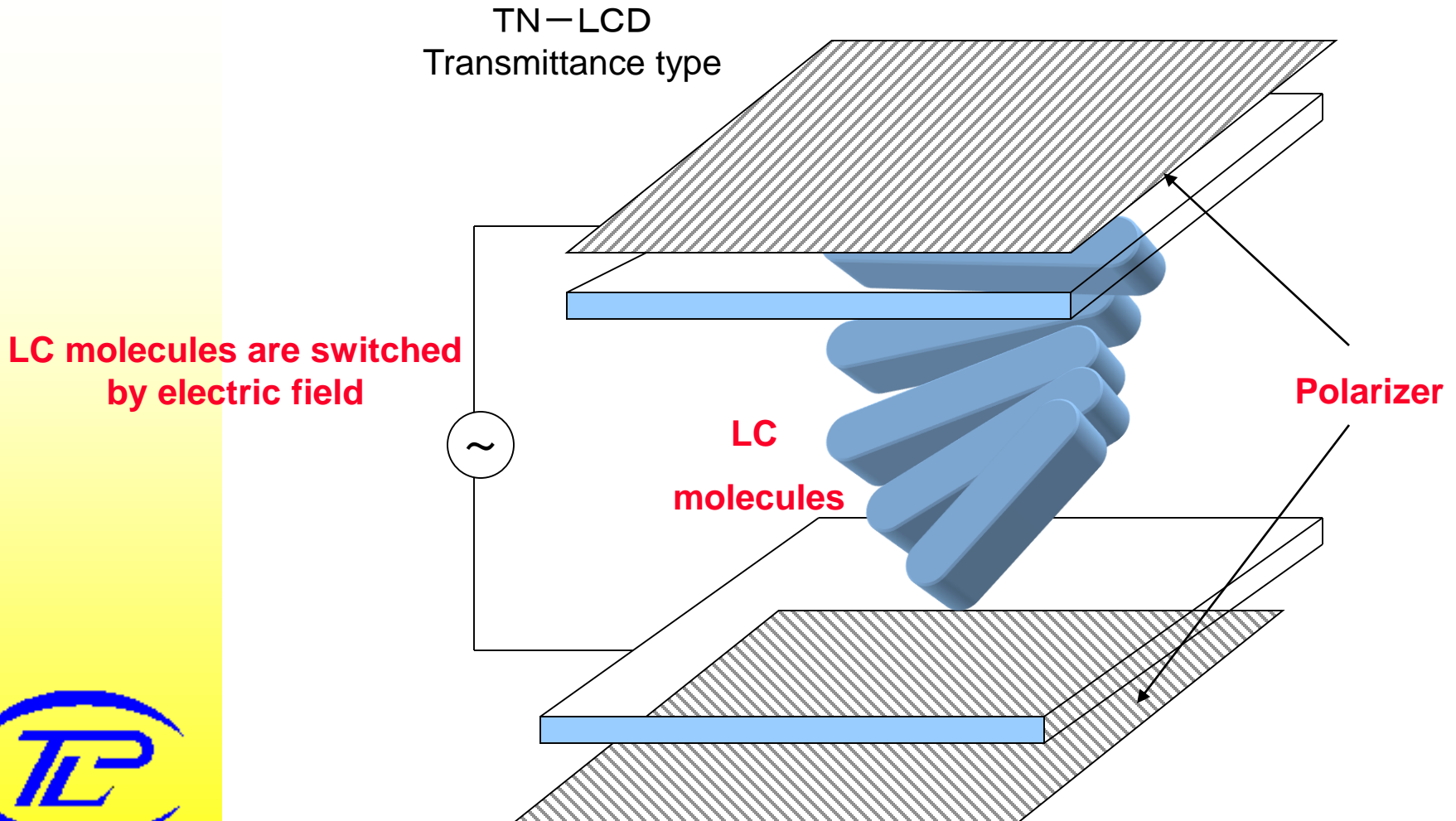
Application of LCD

Polatechno



Structure of TN-LCD

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Function of polarizer

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- **Change to linear polarization from natural light**
- **Light is absorbed into polarizer and it's a function as light shutter**
- **Control of hue**



Kind of polarizer

Polatechno

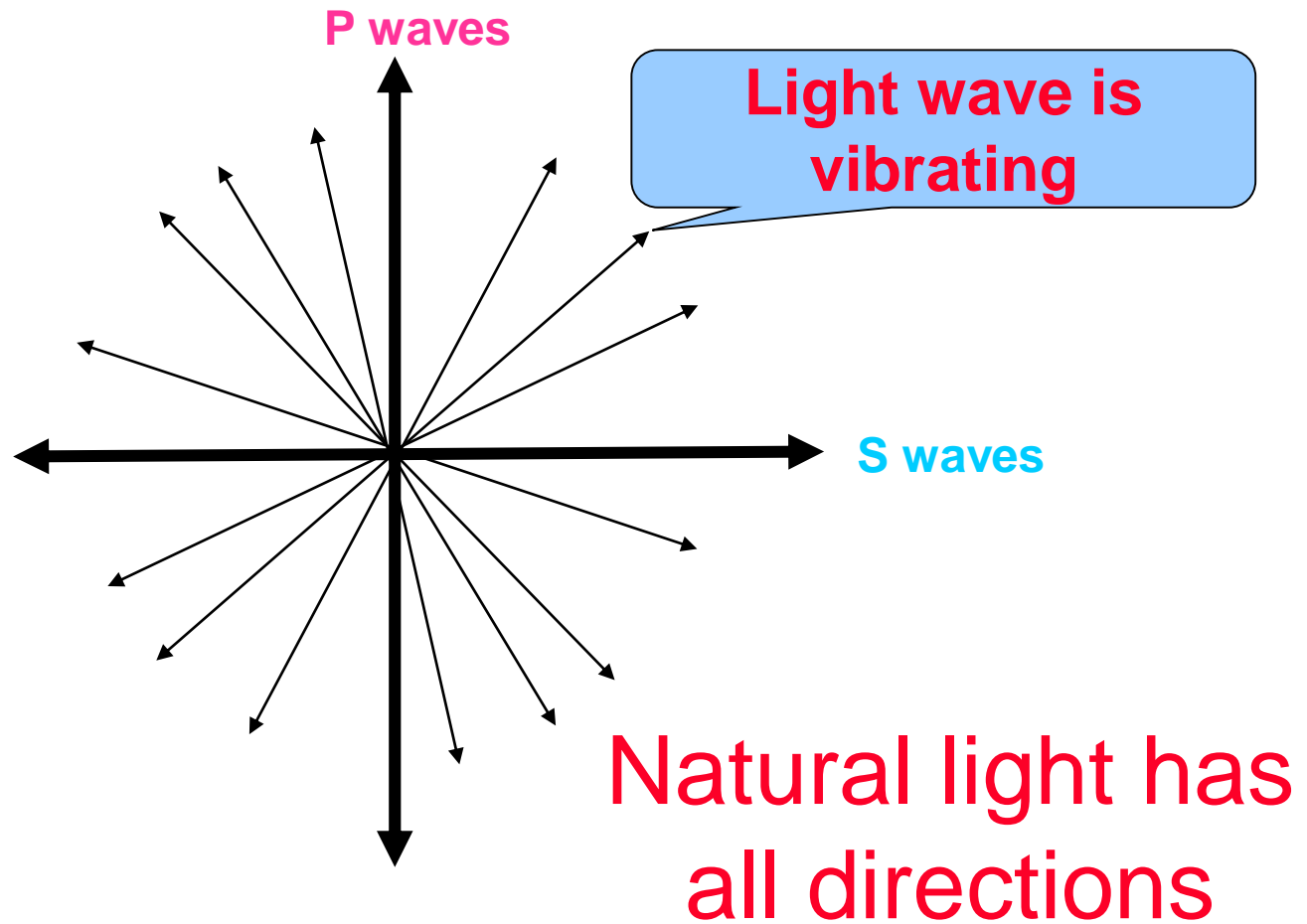
Kinds	Type
Absorption	Iodine
	Dyestuff
Non-absorption	Reflective polarizer (3M DBEF)
	Cholestelic LC coating

Polatechno is producing absorption type polarizer.



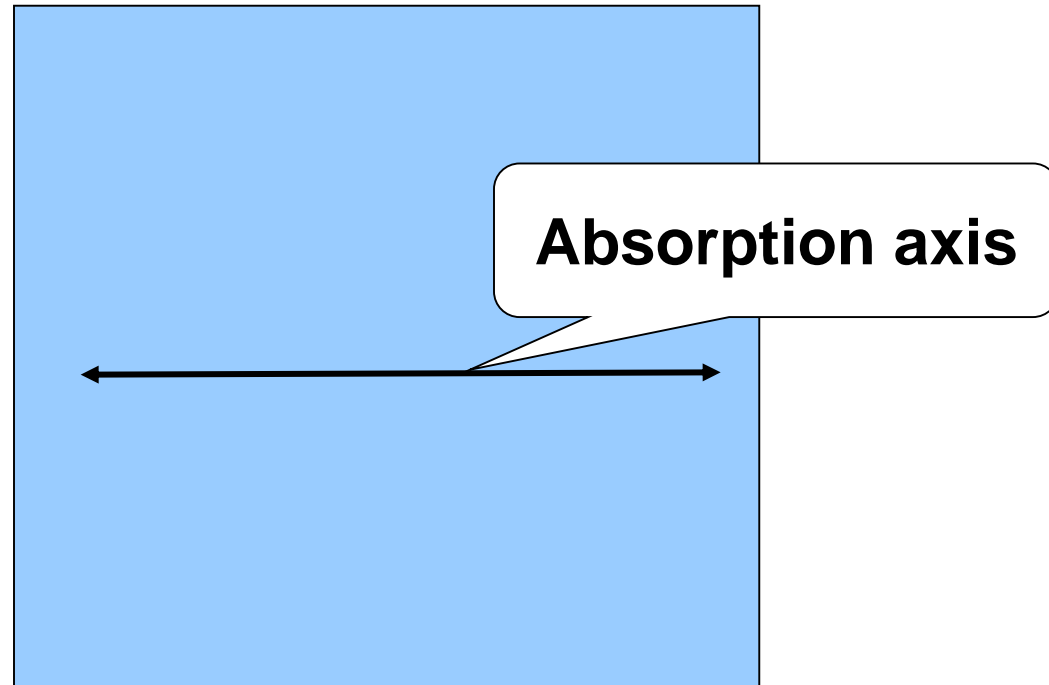
Natural light

Polatechno



Characteristics of polarizer

Polatechno



In this case, S waves is absorbed into Polarizer, because it is same direction of S waves direction and absorption axis.

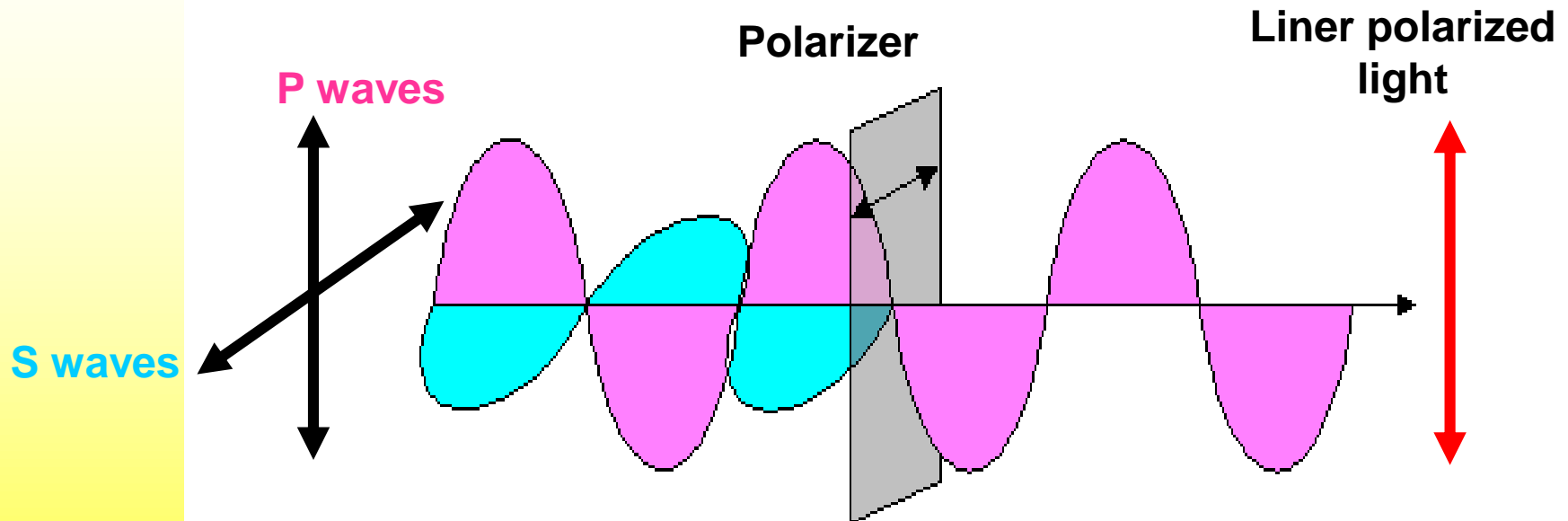
However, P waves pass through Polarizer

→ This passed light becomes linear polarized light.



Characteristics of polarizer

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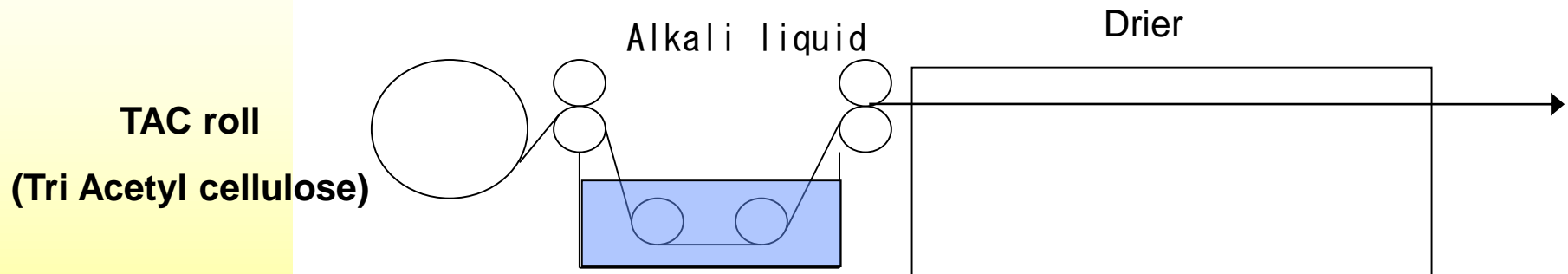


Polarizer manufacturing process

Polatechno

1. PT process: Surface treatment of TAC film

(PT=Pre-Treatment)

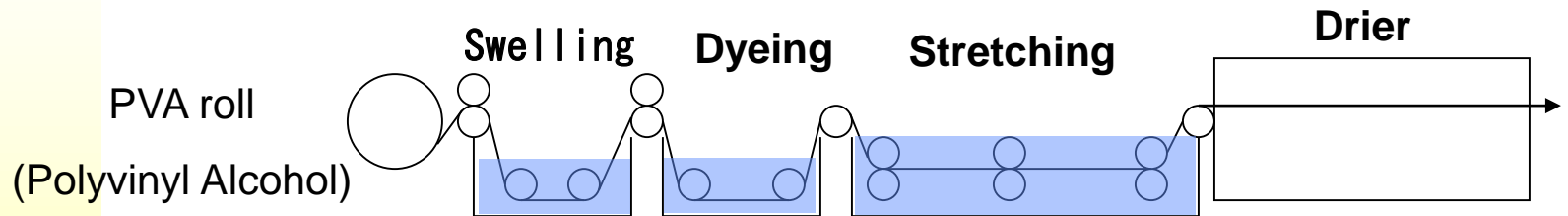


The purpose of PT process is increase the adhesion force between TAC and polarizer element(PVA) in after process.

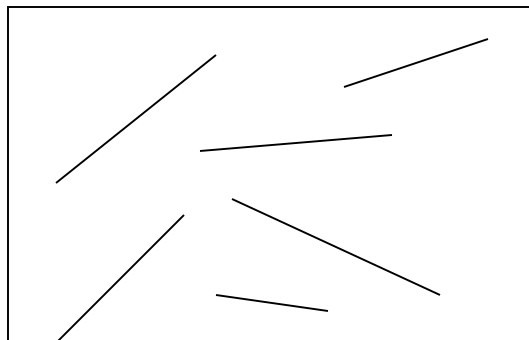


2. 1 Stretching process

PVA film contains iodine or dyestuff to have absorbing function, and it's stretched for make uniform.



Before stretch



PVA alignment: Random

After stretch

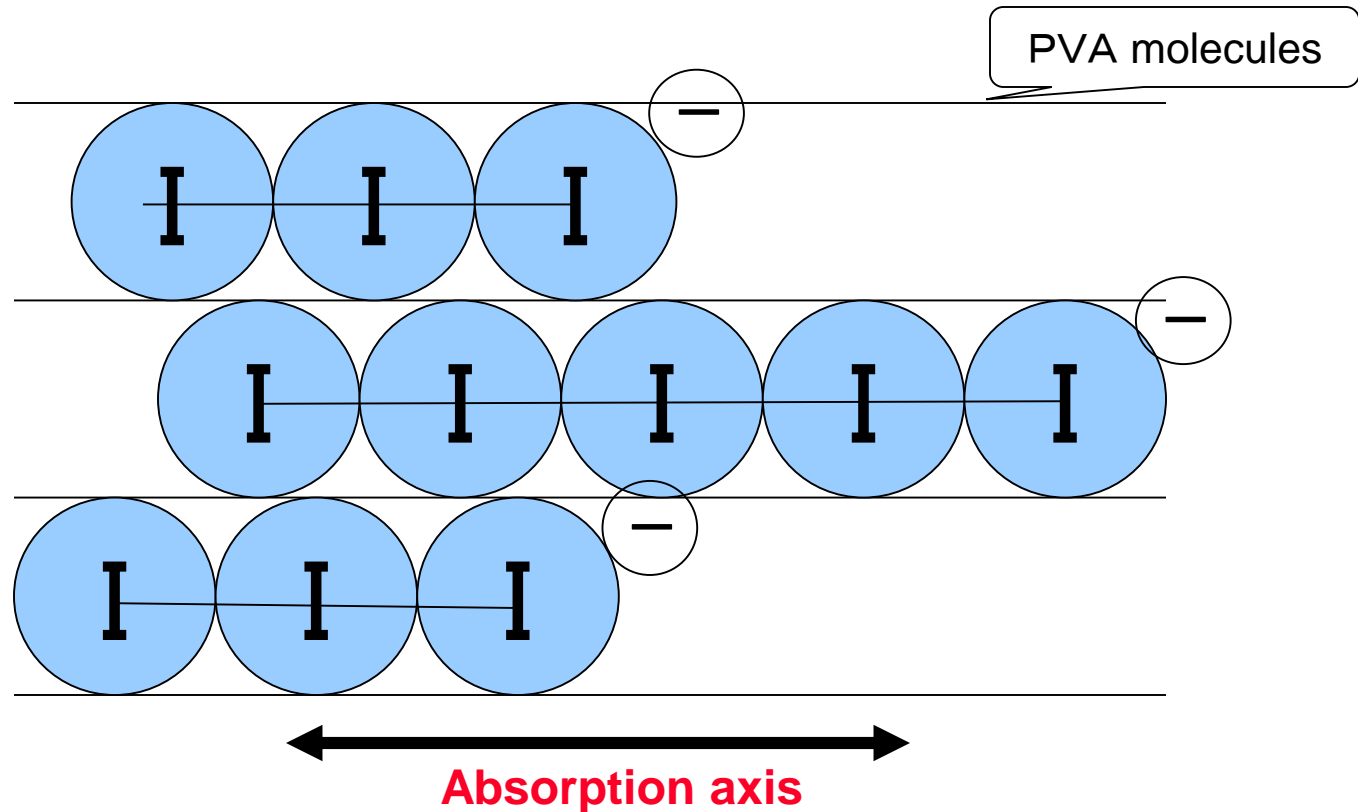


PVA alignment: Uniformity



Orientation of iodine polarizer

Polatechno

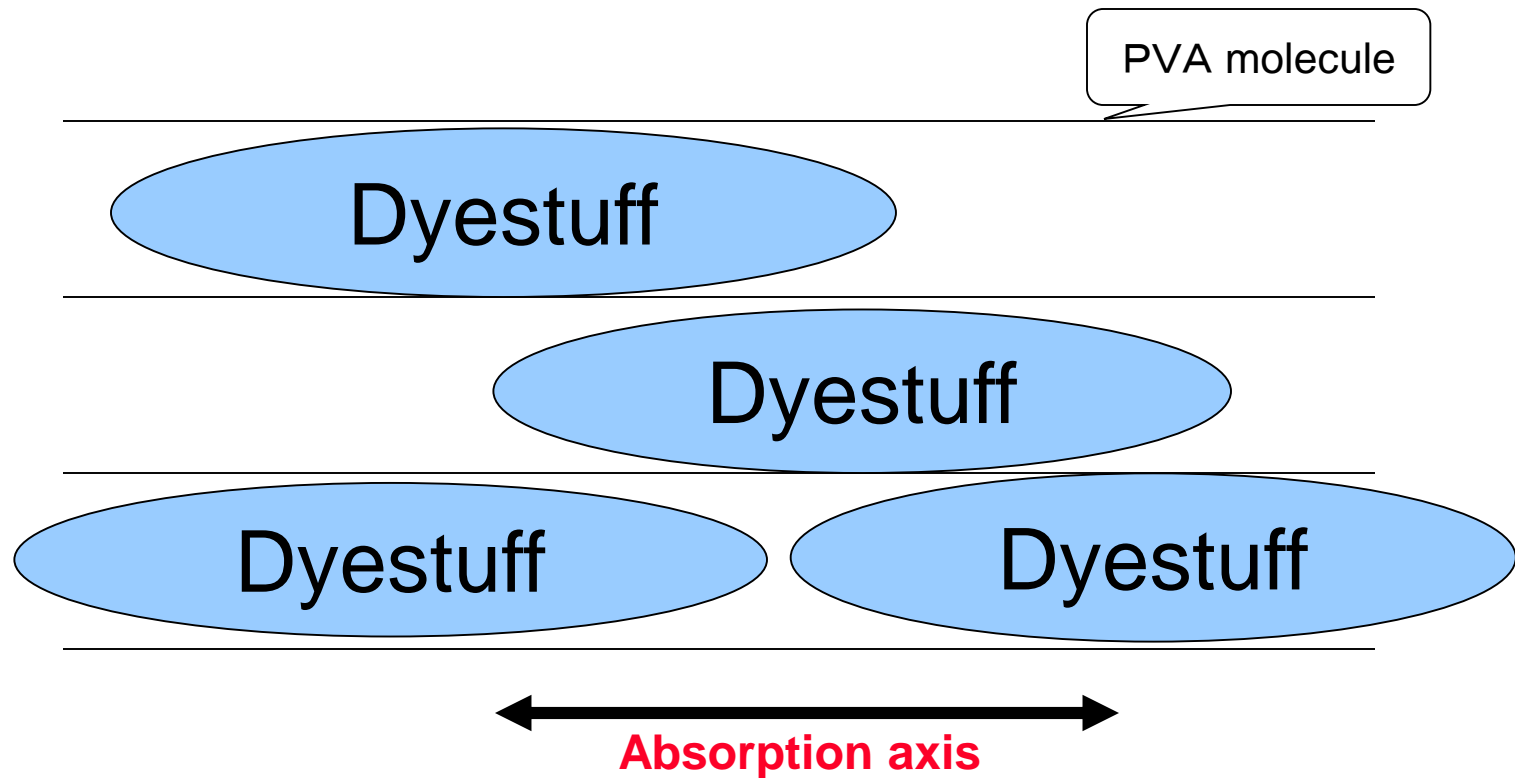


Iodine makes complex of I^{3-} and I^{5-} , and aligned one-way in PVA molecules by stretching process.



Orientation of dyestuff

Polatechno



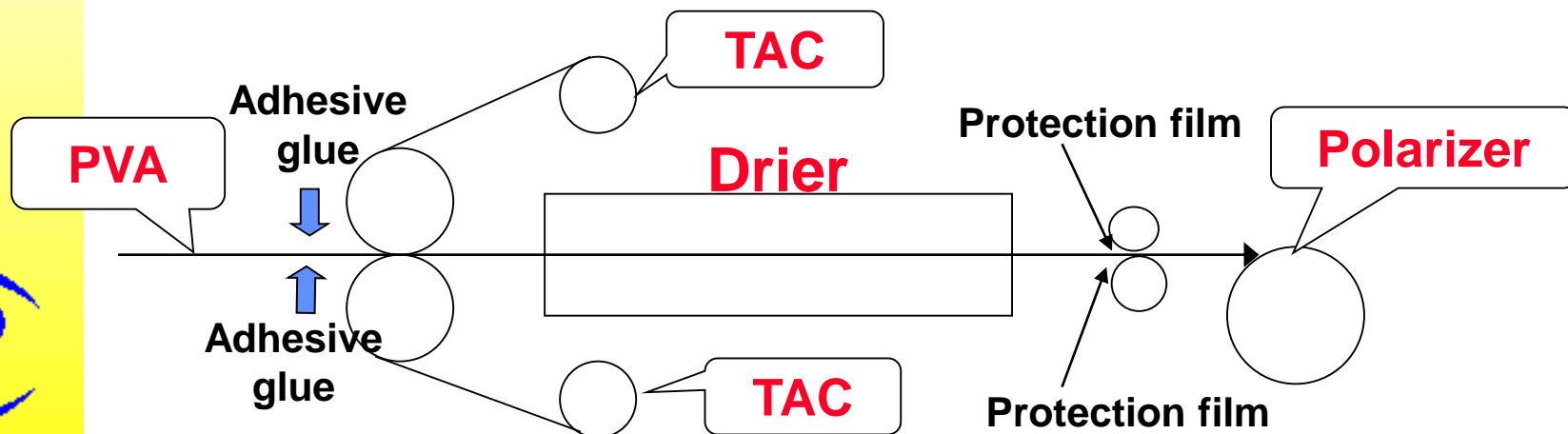
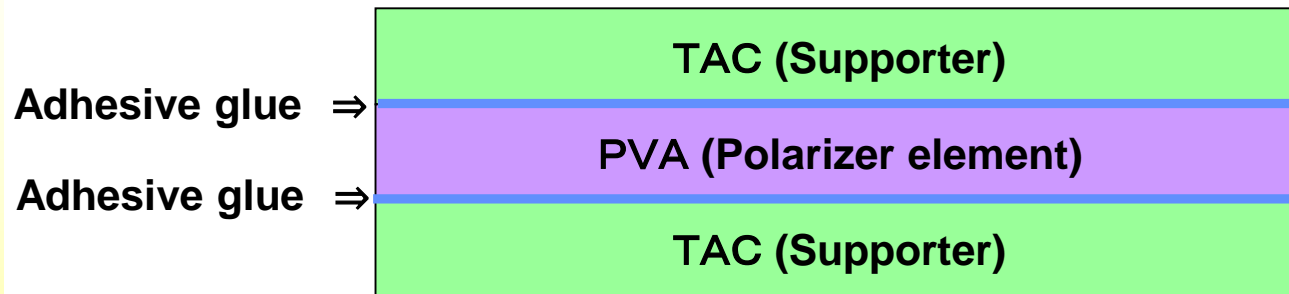
Dyestuff aligned one-way in PVA molecule by stretching process.



2. 2 lamination with TAC and polarizer element

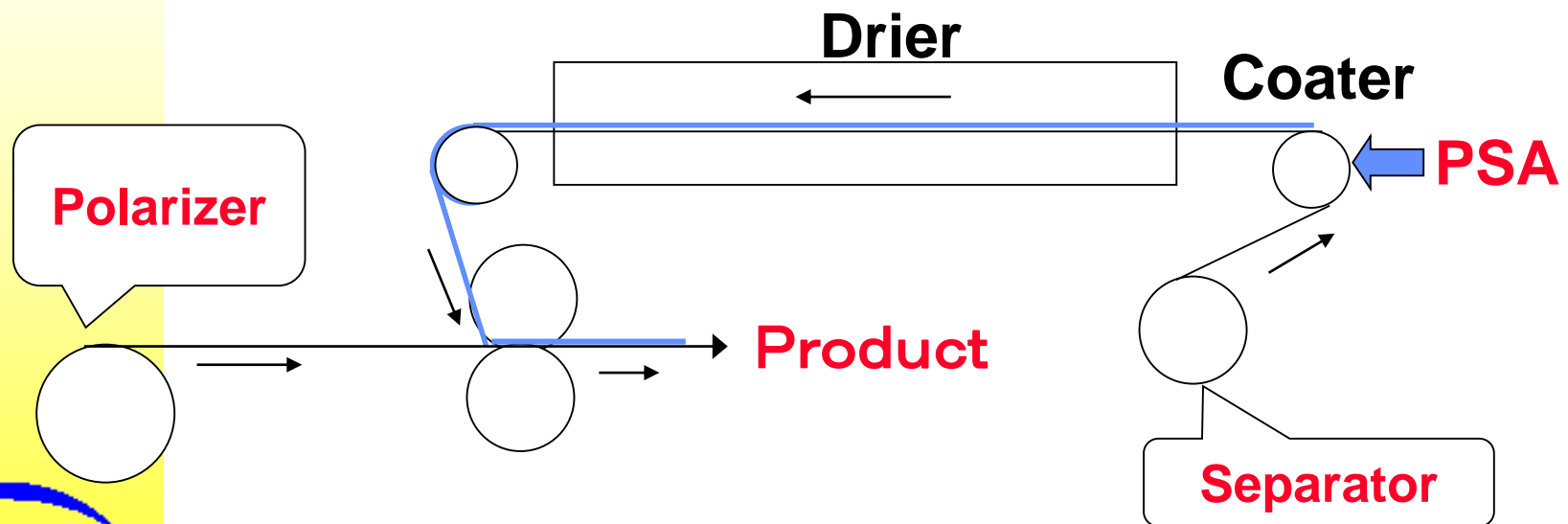
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Polarizer element (PVA) is weak against moisture or thermal , therefore it must be protected by two TAC films with PT process.



3. Coating process

Pressure sensitive adhesive (PSA) is coated on polarizer.
This PSA is usually used with attach on surface of cell.



Other process

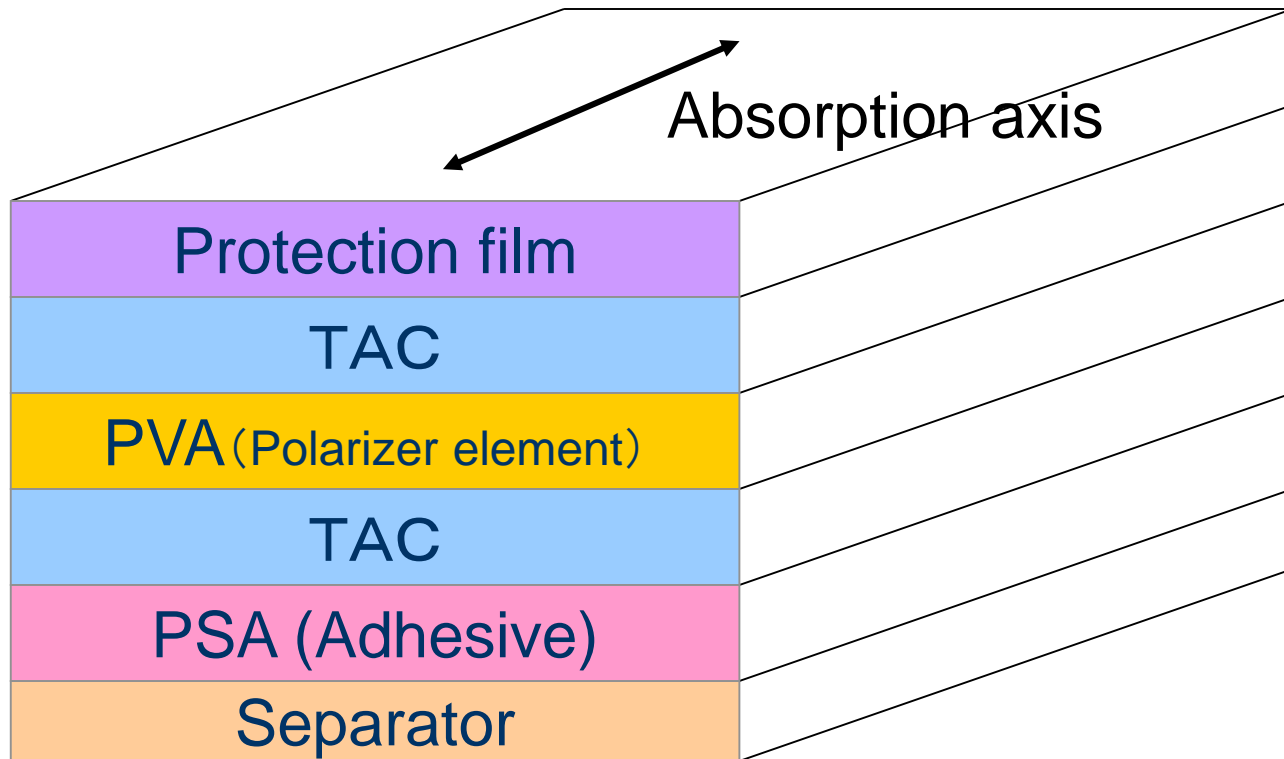
Polatechno

- **Lamination of another function films**
(Retardation film , Reflector , Transflector
etc.)
- **Chip cut**
(Cut the polarizer from sheet to chip)
- **Inspection of appearance**



Structure of polarizer

Polatechno



Polatechno Product

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Group	Character	Grade	Optical Properties		Durability	Application
			Transmission (%)	Polarizer Efficiency (%)	Wet condition	
					Dry contition	
Iodine	General Purpose	LN	43	98.0	40degC x 95%RH 70degC	Watch, Calculator, Mobile phone(mono) etc.
	Paper white color	SKW	45	96.0	40degC x 95%RH 80degC	
	High-Contrast	KN	42	99.9	60degC x 90%RH 80degC	
	Super High-contrast	SKN	43	99.99	60degC x 90%RH 85degC	Auto motive, Mobile phone(color), Note PC etc.
	Super High-contrast & neutral color	SKE	44	99.6	60degC x 90%RH 85degC	Mobile phone(color) etc.
Dyestuff	High durable	THC	40	99.5	80deg x 90%RH 100degC	Auto motive etc.
	Super high durable & high Contrast	SHC-1	40	99.9	80deg x 90%RH 105degC	Automotive, Navigation etc.
	Super high durable & Paper white	SHC-2	45	91.0	80deg x 90%RH 105degC	Auto motive, Outdoor meter etc.

Additional function

Polatechno

Polarizer is possible to combine additional functions accordingly to purpose.

- Anti scratch —> **Hard Coating (HC)**
- Anti glare —> **AG coating**
- Anti reflection —> **AR :Dry vacuum deposition**
—> **LR :Coating**
- Reflective display —> **Reflector**
- Transflective display —> **Transflector**
- STN display etc. —> **Retarder**
- Brightness enhance —> **DBEF film**
- Wide view angle for TN-TFT —> **WV film**
etc.

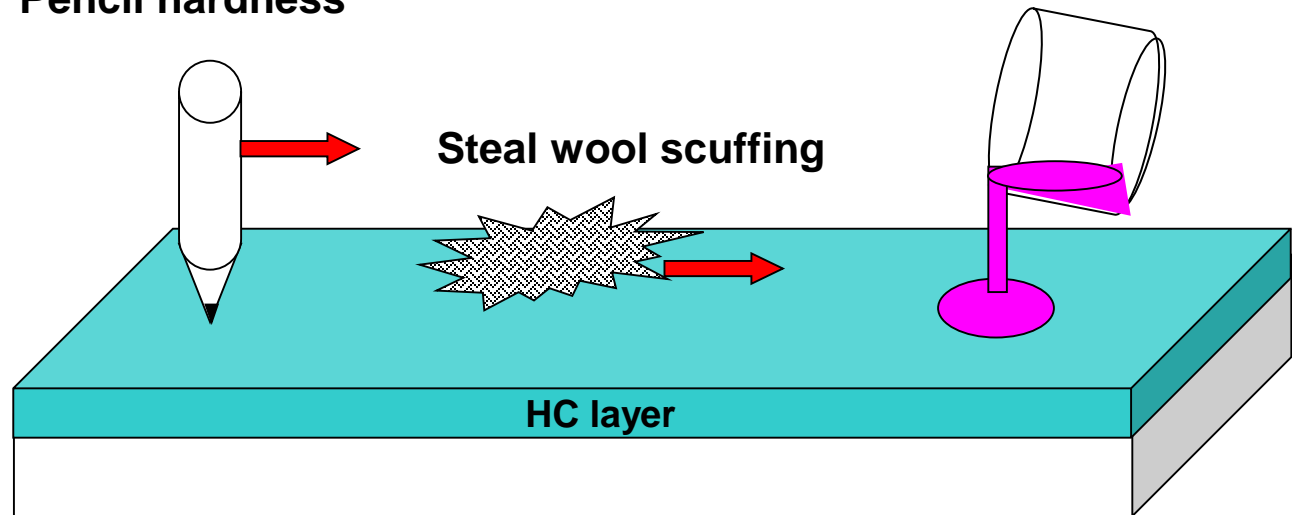


Hard coating(HC)

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Anti scratch and resistance to chemicals.

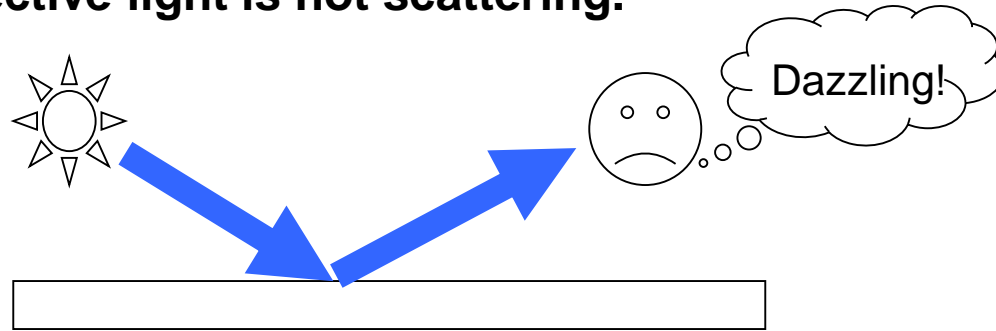
Pencil hardness



Anti Glare (AG)

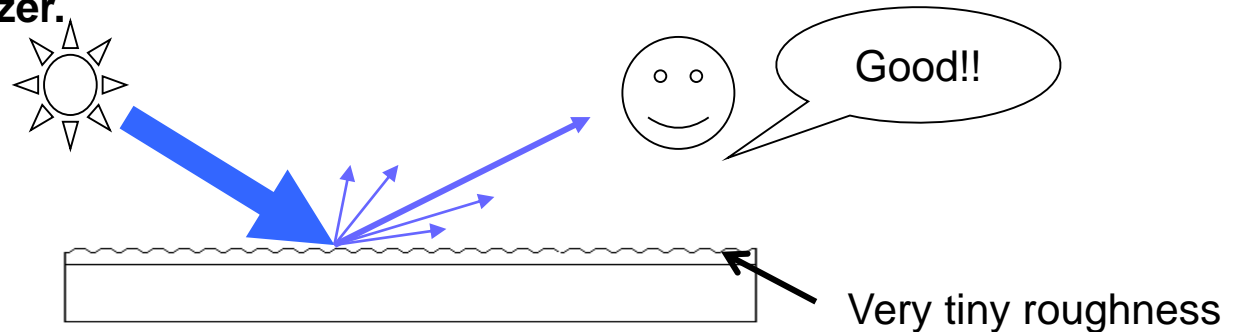
Light is reflected by surface of Polarizer.

This reflective light is not scattering.



Polarizer surface without AG layer

Reflective light is scattered by roughness on surface of Polarizer.



Polarizer surface with AG layer

