

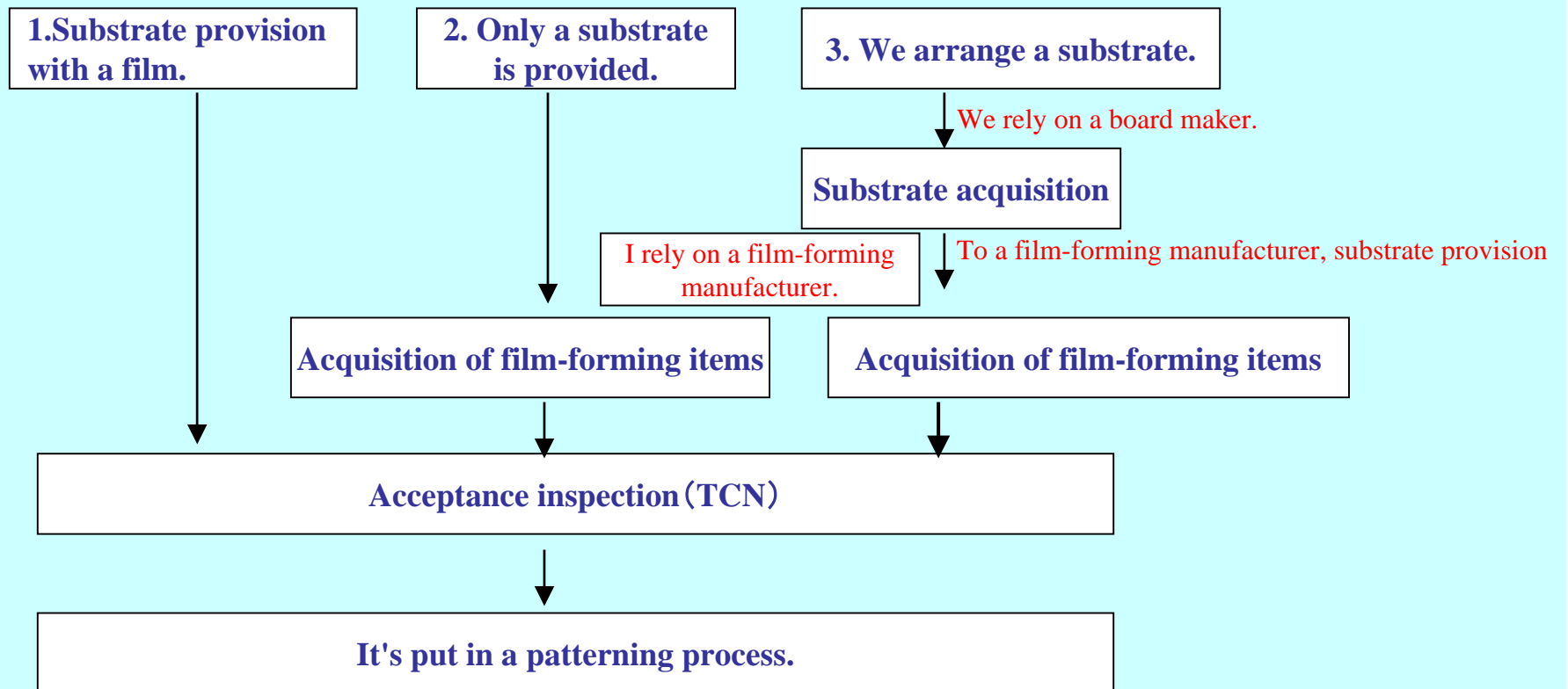
The processing route explanation

TCN

Techno Print Co., Ltd

It's possible to process it at 3 routes.

1. The case, Customer provide a substrate with a film, and we works patterning.
2. The case, Customer provide us glass or substrate, we works film-forming arrangements and patterning.
3. The case patterning arranges a substrate and film-forming variously by us, and into which is processed.



Lead Time (Experimental production)

Lead time after formal order (Experimental production)

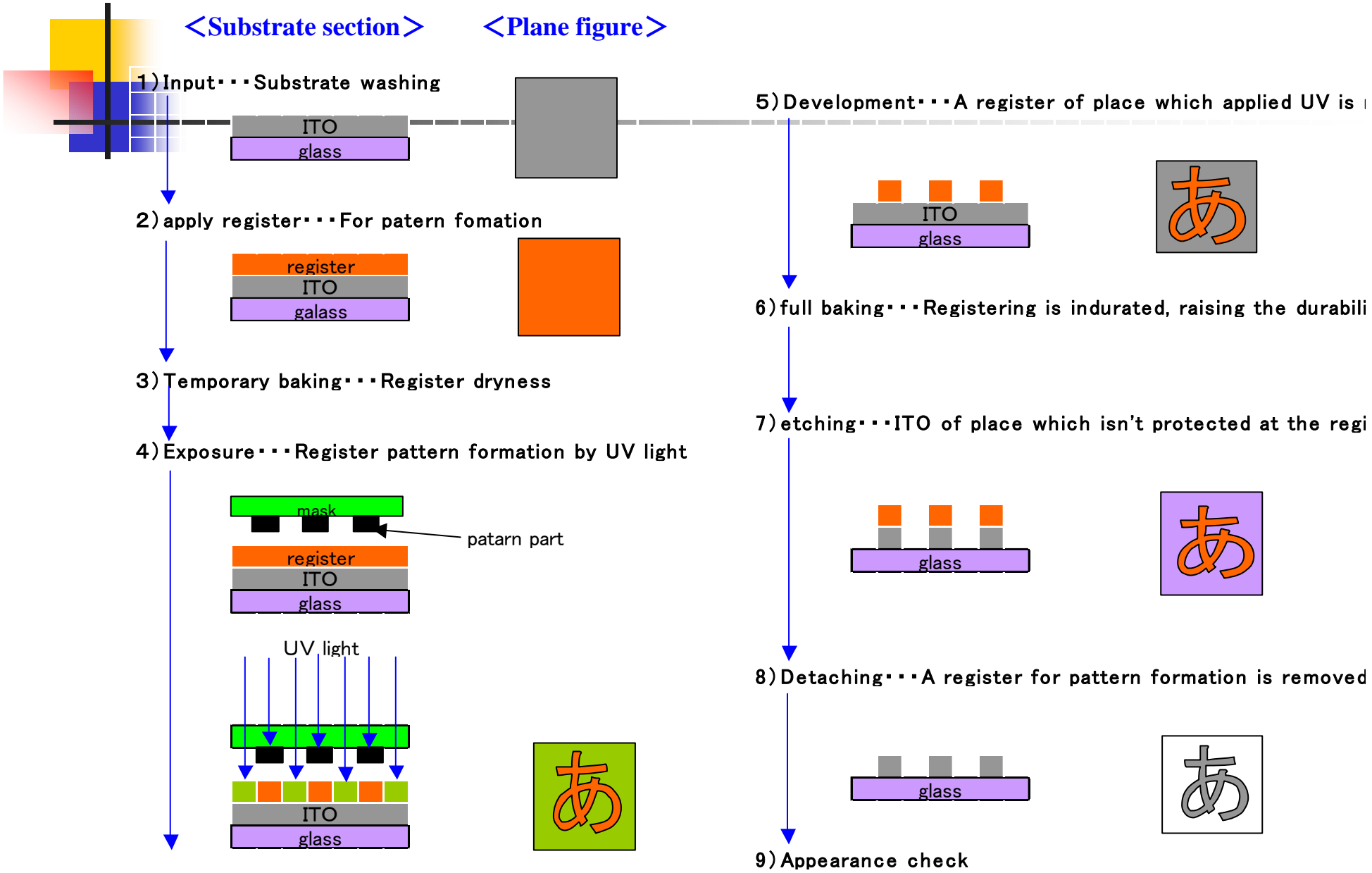
	Only processing.	Mask arrangements + processing	Substrate arrangements + processing	Substrate · Mask arrangements + processing
Substrate	○	○	×	×
Mask	○	×	○	×
Lead Time	3days~	1month~	1.5month~	1.5month~

* There is a possibility of the fluctuation by the quantity and the situation.

The process explanation for ex, ITO



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Example list of results corresponding to a single layer film

Film kind	ITO	α FTO	Cr	Al	Ni	Au	Cu	Ag	Ti	Mo	IZO	合金	FTO
Film thickness unit nm	20~ 450	50~ 200	10~ 300	100~ 1000	100~ 500	100~ 500	100~ 1000	100	100	100	300 10 Ω <	100 ~500	40~ 800
Minimum pitch unit μ m	6	6	6	10	10	20	20	20	20	20	20	20 μ m	2 (mm)
Minimum L/S unit μ m	3/3	3/3	3/3	5/5	5/5	10/10	10/10	10/10	10/10	10/10	10/10	10/10	2/2 (mm)
Forming accuracy (Cr edition use)	$\pm 1 \mu$	$\pm 1 \mu$	$\pm 1 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 5 \mu$	$\pm 5 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 300 \mu$
Processing size (Max work) unit mm	400 \times 500 *300X400	300X400	300 \times 400	300 \times 400	300 \times 400	150 \times 150	300 \times 400	150 \times 150	300 \times 400	300 \times 400	300 \times 400	300 \times 400	150X150



Various single layer film minute patterning

- ① Processing film (Film-forming is out source)
 - ITO、Cr、AL、Ni、Au、Cu、Mo、Ti、FTO, etc
- ② Processing size
 - MAX: Work 470mm × 370mm
 - MIN: 20mm × 20mm
- ③ Processing experience
 - L/S (line/space) = 3 μm / 3 μm ⇒ 6 μ pitch Possible (ITO · Cr)
- ④ Substrate
 - Soda, non-alkaline, quartz, wafer, ceramic and film etc
- ⑤ Quantity
 - It's possible to correspond from 1.

Example list of results corresponding to a multi-layer film

Film kind	ITO/Cr	Cr/ITO	Cr/Al	Ni/Au	Cr/Cu	Al/Cr	MoNb/AlNd /Monb	Al/Mo /IZO	Al/Mo /ITO(低温)
Film thickness unit nm	300/ 300	300/ 300	100/ 500	100/ 500	100/ 500	500/ 200	300/50 /300	100/50 /100	100/25 /100
Minimum pitch unit μ m	6	6	12	20	10	20	20	20	20
Minimum L/S unit μ m	3/3 μ	3/3 μ	6/6 μ	10/10 μ	5/5 μ	10/10 μ	10/10 μ	10/10 μ	10/10 μ
Forming accuracy (Cr edition use) Processing size	$\pm 1 \mu$	$\pm 1 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 3 \mu$	$\pm 5 \mu$	$\pm 5 \mu$	$\pm 5 \mu$	$\pm 5 \mu$
(Max work) unit mm	300 × 400	300 × 400	300 × 400	300 × 400	150 × 150	300 × 400	300 × 400	300 × 400	300 × 400

*When it's including the alignment, please consult separately.



Multi-layer film patterning

① Processing film

- ITO+Cr、Cr+ITO、Cr+AL、Cr+Au、Ti+Cu、AL+Ti、Ti+Al+Ti
Mo+AL+Mo、AL+Mo+IZO、AL+Mo+ITO (low temp,) etc
both sides ITO, ITO+Cr (Film-forming substrate of both sides)
The laminating to which insulation film was added is also possible.

② Processing size

- MAX: 400mm × 300mm
- MIN: 100mm × 100mm
- *depends on membrane composition

③ alignment precision

- $\pm 3 \mu\text{m}$ In the range

④ Processing composition

- Not only Laminating pattern but also
the laminated pattern through the insulation film is possible.

Lift off Processing

① Technical description

- The technology by which etching processing does pattern processing of a difficult film

Registering forms the reverse pattern.

Film-forming implementation of a necessary film after film-forming and resist removal.

Example: Si、Pt、Ta etc

*There is designation in the film-forming temperature. (about 100°C)

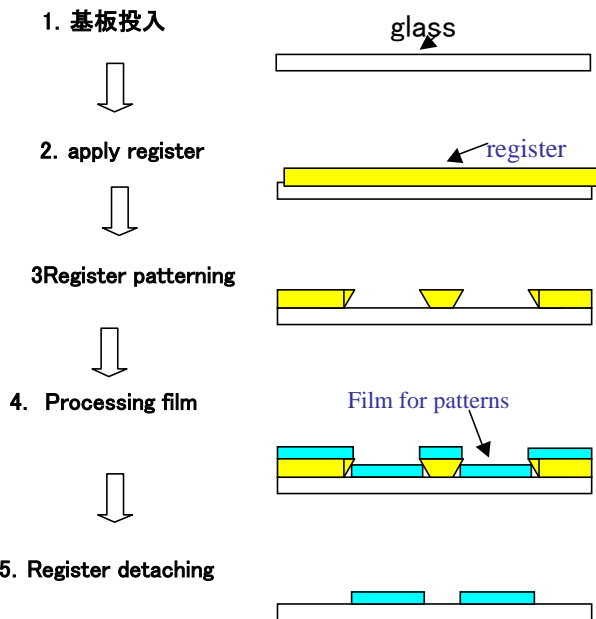
② Processing Size

- MAX: 300mm × 300mm Glass substrates
Effective area: ϕ 300mm
- MIN: 20mm × 20mm

③ Processing experience

- L/S=5 μ m/5 μ m

◎process image



Glass processing (counterbore, drilling, cap groove, etc.)

① Processing

- counterbore, drilling, cap groove
- MAX: Supports up to 500 mm x 400 mm
- MIN: 100mm × 100mm

③ accuracy

- Counterbore
(50% of basic glass thickness,)
- Please contact us for other specifications.

④ substrate

- Soda glass, non-alkali glass, quartz, wafers, etc.
(Supplied by the customer, can be arranged by us)





Pasting processing

① The processing contents

- Glass + Glass pasting processing.
- Glass + Film pasting processing. (The specification needs consultation.)

② Processing size

- MAX: 400mm × 360mm

It's possible to process it into glass substrates. Glass substrates

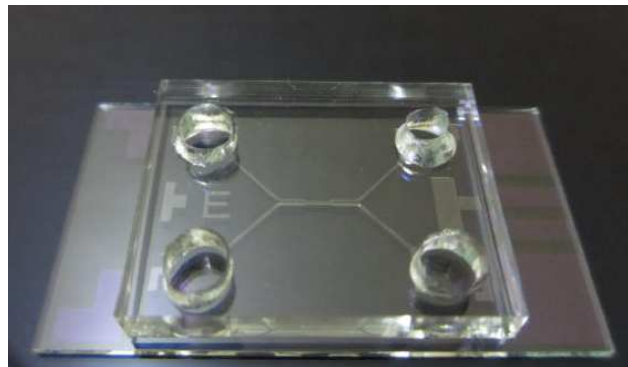
G + G: 400mm × 360mm

G + F: (Specification consultation need)

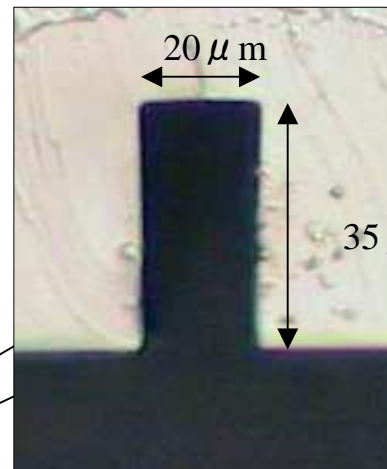
③ Processing results

- Between the glass + glass Gap: 0.01mm (Paste by sticker material.)
- precision: $\pm 20 \mu m$

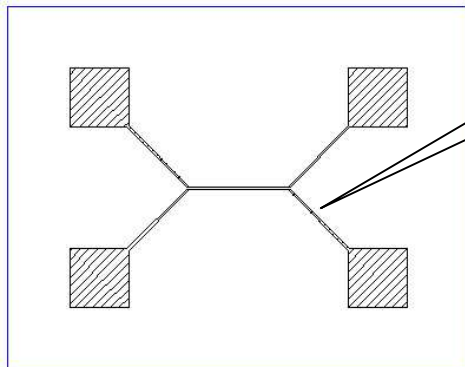
Schematic of a Micro channels



Expansion section



- width: $20\ \mu\text{m} \sim 200\ \mu\text{m}$
(precision : $\pm 5\ \mu\text{m} \sim \pm 10\ \mu\text{m}$)
- height: $5\ \mu\text{m} \sim 40\ \mu\text{m}$
(precision: $\pm 2\ \mu\text{m} \sim \pm 5\ \mu\text{m}$)



• Micro channels are accumulated by using fine processing technology, for the purpose of biotechnology and a chemical analysis (system)

*A mix of solution, a reaction, a separation, refinement and detection make various chemical operation.

Outward form cutoff processing and chamfering processing

① The processing contents

- Scribe, dice cutting (outside order) and thread chamfering

② Processing size

- Scribe (common difference: $\pm 0.2\text{mm}$)
MAX: $500\text{mm} \times 400\text{mm} \Rightarrow$ MIN: $10\text{mm} \times 10\text{mm}$
- Dice cutting (common difference: $\pm 3 \mu\text{m}$)
MAX: $300\text{mm} \times 300\text{mm} \Rightarrow$ MIN: $0.3\text{mm} \times 0.3\text{mm}$

- The thickness $\dots 0.1\text{mm} \sim 10 \pm 0.05\text{m}$
* It depends on substrate material condition.

③ Substrate

- Soda glass, Non-alkali glass, Quartz, wafer, etc..
(Supply or arrangement)

Stencil process printing

① Processing possible film

- Register, Ag etc..

② Processing size

- MAX: 400mm × 360mm > It's possible to process it into glass substrates.
MIN: 100mm × 100mm

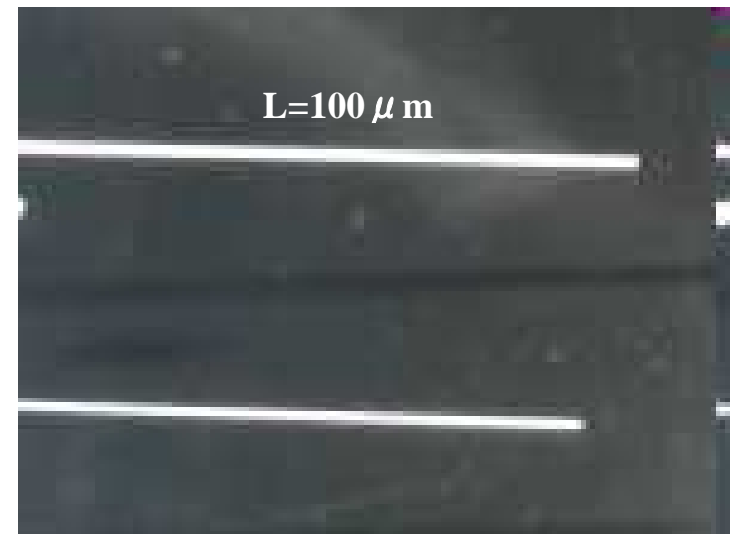
③ Processing results

- L/S=100 μ m/100 μ m

④ Substrate

- Soda glass, Non-alkali glass, Quartz, wafer, etc..
(Supply or arrangement)

<Ag print processing example>



Protective film / insulating film coating

① Processable film type

- Resist, polyimide, etc. (Other supplies are also available)

② Processing size

- Roll coater MAX: 470mm × 370mm (Resist)
- Spin coater MAX: 300mm × 300mm (Resist, polyimide, etc.)
 - * Effective area is ϕ 300mm.
- Bar coater MAX: 300mm × 400mm (Resist, polyimide, etc.)

③ Film formation

- For resist, both roll coater and spin coater are 1–2 μ m.
- The film thickness can be adjusted according to the request such as polyimide (\sim 5 μ m).
 - Apply with a spin coater.

* Please contact us for other film thickness adjustments.

Light-sensitive resin patterning

- ① The processing possible film kind
 - Register, polyimide, resin black and exposure to light Ag (MAX170□) etc.
- ② Processing size ▪ MAX: 300mm × 300mm
 - *Effective area: ϕ 300mm
- ③ Processing results

	Line	Space
Resiser	3 μ m	3 μ m
Polyimide	10 μ m	10 μ m
Resin black	7 μ m	15 μ m
Expouse	30 μ m	50 μ m

FPC pressure gluing

① Technical description

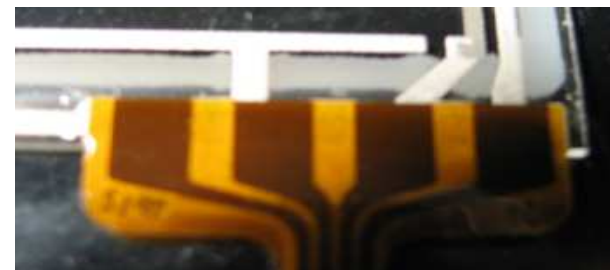
- We'll paste FPC together substrate made by us or provision substrate.
ACP,ACF It's possible to correspond.

② Processing size

- MAX : 300mm × 300mm It's possible to process it into glass substrates.
MIN : 100mm × 100mm
*Please consult about the FPC size .

③ The forming accuracy

- The alignment precision $\pm 0.2\text{mm}$



Mask making

① The processing outline

- Image figures by customer's handwriting and CAD figures, etc. are changed to a mask figure and photomask production is performed.

② The mask kind

	Substrate	Precision	Life	Cost
Cr MASK	Quartz Glass	◎	○	High
	Soda Galass	○	○	Middle
Em MASK	Soda Glass	○	△	Middle
Film MASK	Film	×	×	Low

③ The edition size

- Max 470mm × 370mm
- ※Min about 4" × 4" size