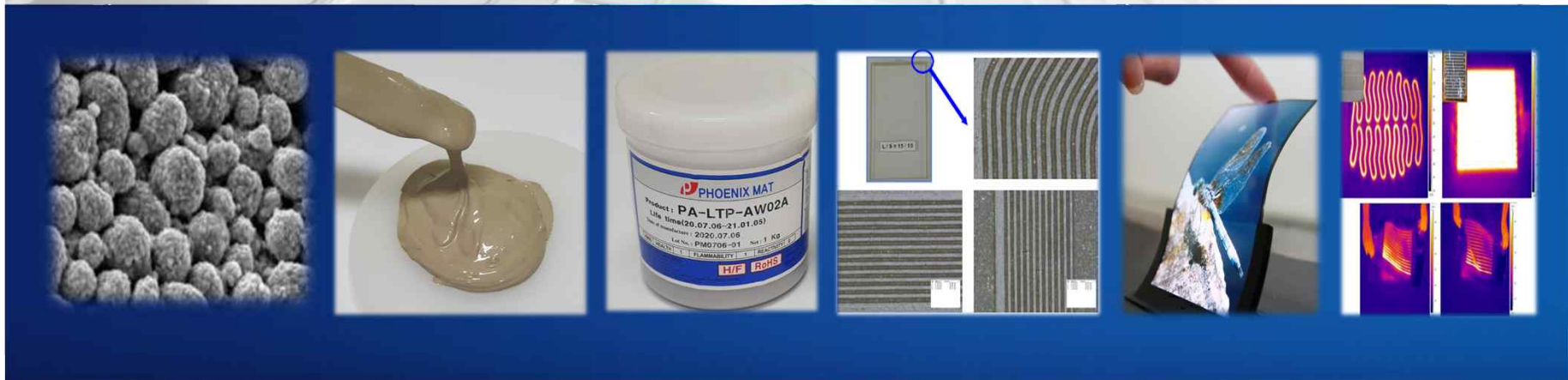


A World Leader in Electronics Materials



PHOENIX MAT



❖ Company Profile

Profile

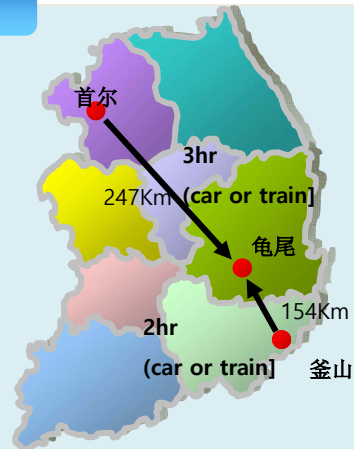
- CEO : Hay-Keun, Yoo[庾海根]
- Establishment : 2019年 12月
- Core Technology
 - Metal (Ag)Conductivity paste
 - Industrial heat Sink Ag paste
 - Carbon Paste
 - Functional Paste

Company

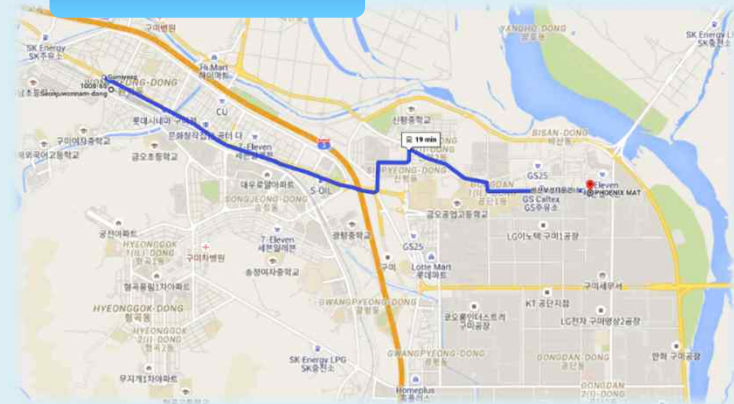


§ Location : 68-46, Suchul-daero 9-gil, Gumi-si, Gyeongsangbuk-do, Republic of Korea

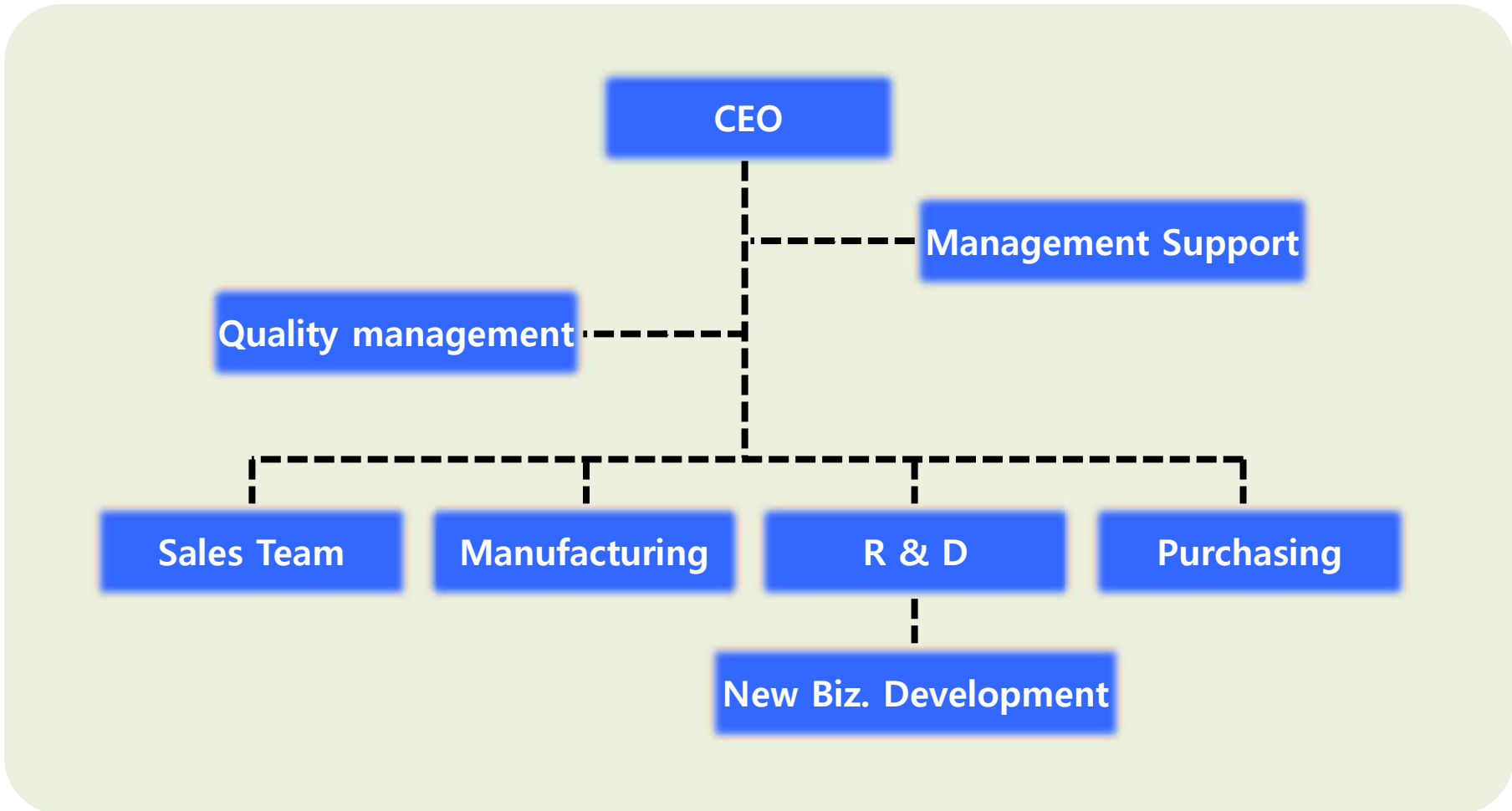
회사 위치



location



❖ Organization



❖ Certifications

ISO-9001

Certified on Jun. 2023

Registration no.	KQ 202856	IAF Code	12
First issue date	2020-06-05	Issue date	2023-06-05
Expiry date	2026-06-04	Reissue date	2023-06-02

Quality Management System Certificate
KS Q ISO 9001:2015/ISO 9001:2015

We certify that the Quality Management System of the Organization:
PHOENIXMAT Co., Ltd.

is in compliance with the standard KS Q ISO 9001:2015/ISO 9001:2015 for the following products/services:
Development and production of display panel materials

General Manager
Seung-Chan Lee

Maintenance of the certification is subject to continual surveillance audit and dependent upon the observance of Kiwa Korea's certification criteria.

Kiwa Korea Ltd.
411, SJ Technoville,
278, Beotkkot-ro,
Gwanak-gu,
Seoul, Korea
Tel: +82.2.3397.0101
Fax: +82.2.3397.0105
URL: www.kiwa.kr

Certified Sites
68-46, Suchul-daero 9-gil, Gumi-si, Gyeongsangbuk-do, Korea

KAB-CC-34

CERTIFICATE

ISO-14001

Certified on Jun. 2023

Registration no.	KE 201704	IAF Code	12
First issue date	2020-06-05	Issue date	2023-06-05
Expiry date	2026-06-04	Reissue date	2023-06-02

Environmental Management System Certificate
KS I ISO 14001:2015/ISO 14001:2015

We certify that the Environmental Management System of the Organization:
PHOENIXMAT Co., Ltd.

is in compliance with the standard KS I ISO 14001:2015/ISO 14001:2015 for the following products/services:
Development and production of display panel materials

General Manager
Seung-Chan Lee

Maintenance of the certification is subject to continual surveillance audit and dependent upon the observance of Kiwa Korea's certification criteria.

Kiwa Korea Ltd.
411, SJ Technoville,
278, Beotkkot-ro,
Gwanak-gu,
Seoul, Korea
Tel: +82.2.3397.0101
Fax: +82.2.3397.0105
URL: www.kiwa.kr

Certified Sites
68-46, Suchul-daero 9-gil, Gumi-si, Gyeongsangbuk-do, Korea

KAB-EC-01

CERTIFICATE



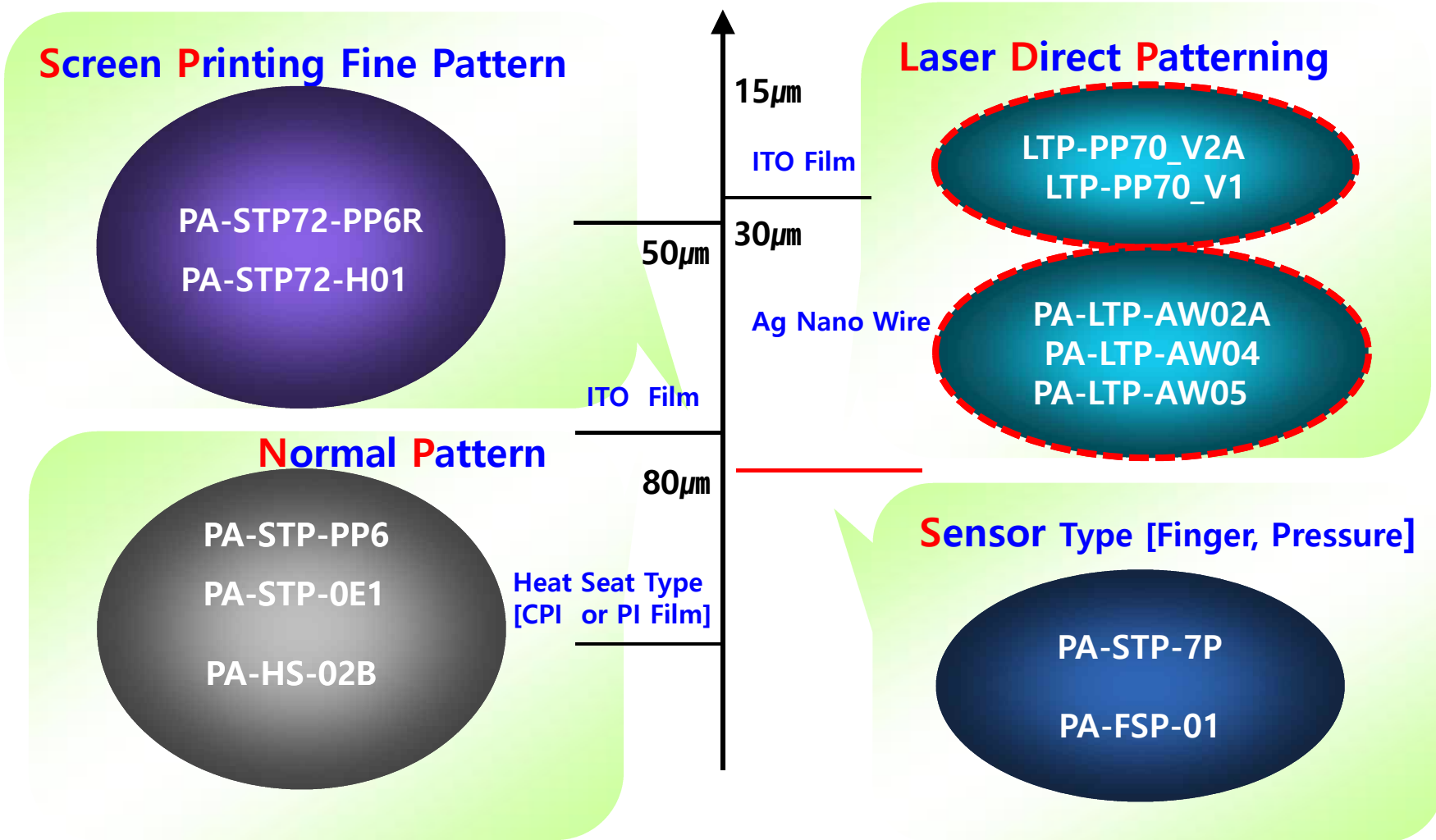
Index

Company : PHOENIX MAT

**Factory : 68-46, Suchul-daero 9-gil,
Gumi-si, Republic of Korea**

- **Products Matrix**
- **Paste Quality Merit**
- **Paste Manufacture Process**
- **Products**
 - 4~5. ITO & ANW Film type- laser Etching Pattern**
 - 6. Screen Printing Pattern Type**
 - 7. Heat Seat Type**
 - 8~9. Sensor Type (Finger or Pressure)**
 - 10. Low Temperature Sintering Paste**
- **Major Customers**

01 Products Matrix



02 Paste Quality Merit

Top class - AG Paste Development Technique

Paste process
Know-How

Paste Quality control
Ag paste Mass product

BACK GROUND

Composition control

- chemical composition
- Lot reproducibility
- Process filtering system

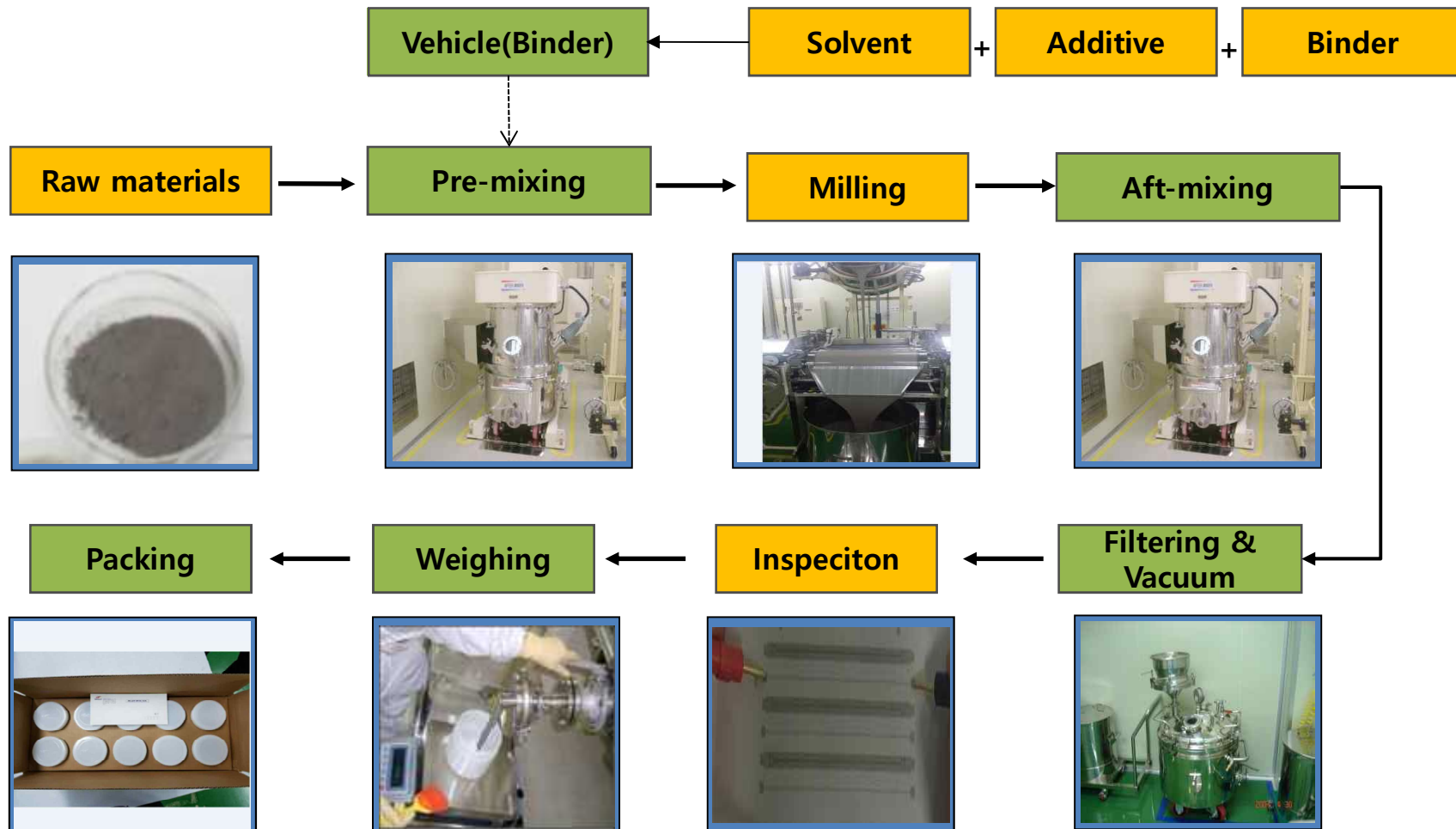
Printing & Adhesive

- Rheological control
(viscosity, Thexotropy)
- Conductivity control
- Dry condition control

Corrosion inhibit

- Ag powder control
- Corrosion inhibit
composition technique
- Ag powder dispersion

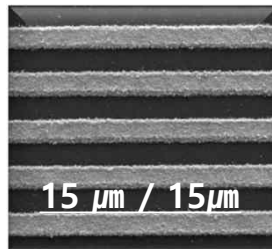
03 Paste Manufacture Process



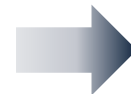
04 Laser Patterning Ag Paste for ITO Fine Pattern



- ◆ Fine Line Width (Up to 15 μ m / 15 μ m)
- ◆ **Strong Adhesion on ITO Film, PET and Glass Substrate (Heat durability)**
- ◆ **Improved Dispersibility : Reduced large Ag Particles Left behind on Spaces After Etching**
- ◆ Little Change in Viscosity During Continuous Printing



3r Bending

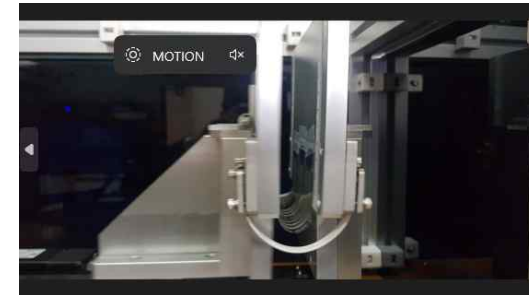
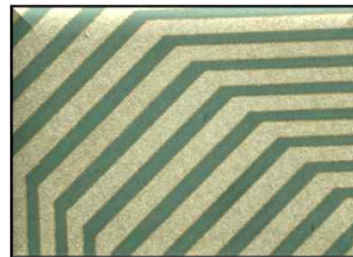
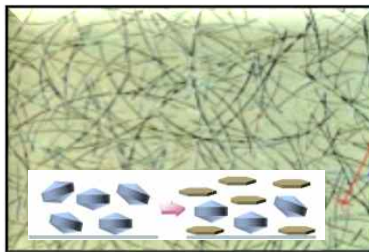


■ Product Specifications

Item	PA-LTP-PP70_V2A	PA-LTP-PP70_V1
Viscosity	40 Kcps	40 Kcps
Resistivity	7.0 * 10 ⁻⁵ Ωcm	7 * 10 ⁻⁵ Ωcm
Pattern / Space	15 μ m / 15 μ m	25 μ m / 25 μ m
Bending (r: 3mm: 50k)	10% under(PET)	10% under(PET)
Dry	135°C / 40min	135°C / 40min
Similar products	PA-LTP-PP70_V2A(LTP747)	PA-LTP-M01

05 Laser Patterning Ag Paste for Ag Nano Wire Film

- ◆ Excellent Contact Resistance On ANW Layer
- ◆ Stable Resistance in Repeated Bending & Flexibility
- ◆ Use Small and Large Touch Screen : Smartphone, Notebook, Digital Signage



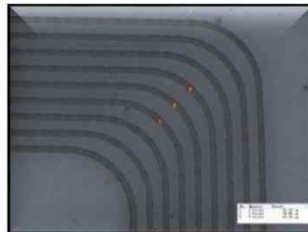
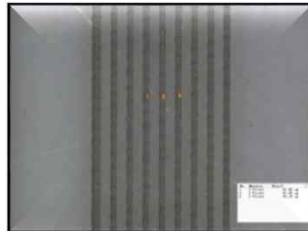
Product Specifications

Item	PA-LTP-AW02A	PA-LTP-AW04	PA-LTP-AW02P
Viscosity	110 Kcps	60 Kcps	110 Kcps
Resistivity	$5.0 \times 10^{-5} \Omega \text{cm}$	$7.0 \times 10^{-5} \Omega \text{cm}$	$5.0 \times 10^{-5} \Omega \text{cm}$
Pattern	30 μm	25 μm	30 μm
AGNW	Cambrios , C3Nano type	C3 Nano type	PC Film type
Bending (r: 3mm: 100k)	5% under(PET)	10% under	
Dry	85°C/50min	90°C/40min	85°C/50min
Similar products	AN154, AN118		

06 Screen Printing Ag paste for Fine Pattern



[~ Fine Pattern Type]



Product Code	Pattern	Viscosity (Kcps / rpm)	Dry Con. (°C / min)	Resistance	Materials
PA-STP72-PP6R	50 μ m	163 / 40	135 / 10	6 x 10 ⁻⁵ Ω ·cm	ITO Film ITO Glass
PA-STP72-PP6	80 μ m	130 / 40	135 / 10	6 x 10 ⁻⁵ Ω ·cm	
PA-STP-0E1 (Low Temp.)	100 μ m	20 / 120	85 / 50	5 x 10 ⁻⁵ Ω ·cm	
PA-STP-05P	100 μ m	60/40	85 / 10	6 x 10 ⁻⁵ Ω ·cm	PC Film

[~ Via Hole Type]



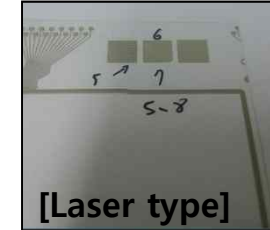
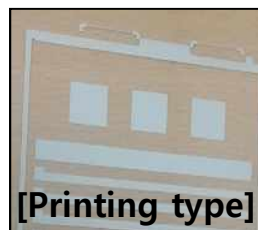
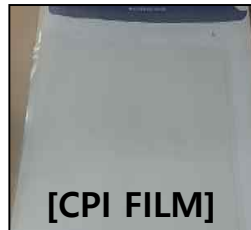
Product Code	Pattern	Viscosity (Kcps / rpm)	Dry Con. (°C / min)	Resistance	Materials
PA-STP70-PP55 (Low Temp.)	100 μ m	50 / 120	85 / 50	5 x 10 ⁻⁵ Ω ·cm	Via hole

07 Screen Printing Ag paste for Heat Seat Film

[Heat Seat PI Film]



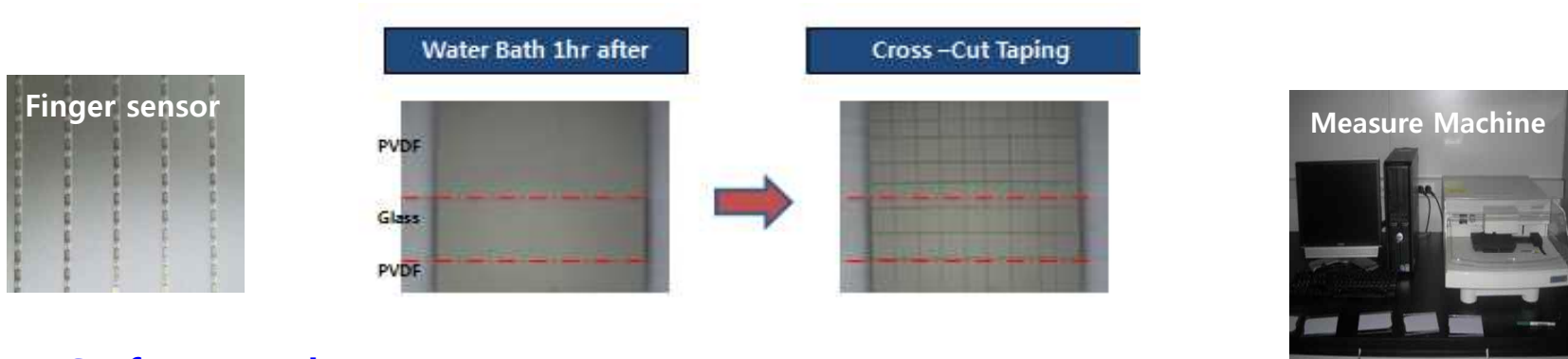
[CPI Film]



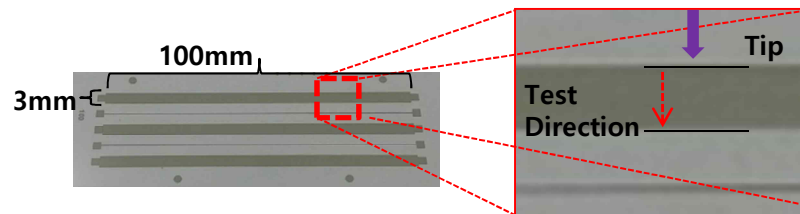
Product Code	Viscosity (Kcps / rpm)	Dry Con. (°C / min)	Resistivity	Materials
PA-HS-02B	70 / 10	150/10(IR) ->300/60(dry)	$2 \times 10^{-5} \Omega \cdot \text{cm}$	PI Film
PA-HS-02A	70 / 10	135/40(dry)	$5 \times 10^{-5} \Omega \cdot \text{cm}$	CPI Film Printing type
PA-LTP-PP70_V2A	40 / 40	135/40(dry)	$7 \times 10^{-5} \Omega \cdot \text{cm}$	CPI Film <u>Laser Etching Type</u>

08 Screen Printing Ag paste for Finger Sensor Type

[Finger Sensor- PVDF Adhesion]



[Ag Surface Roughness : α - step]

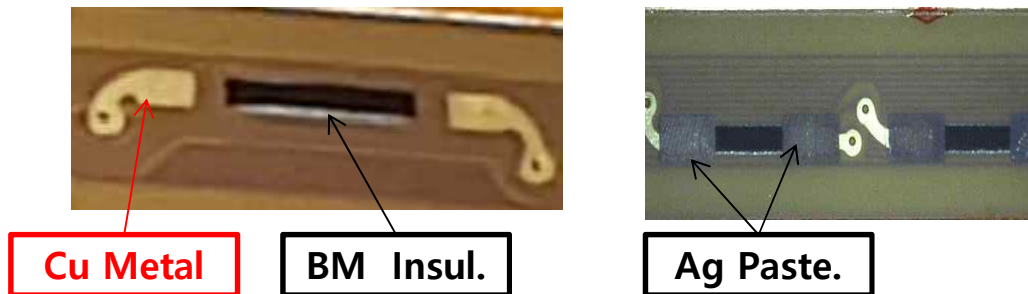


	Printing	Thickness	Rz
Size (μm)	1回	6.3	0.967
	2回	10.8	1.335

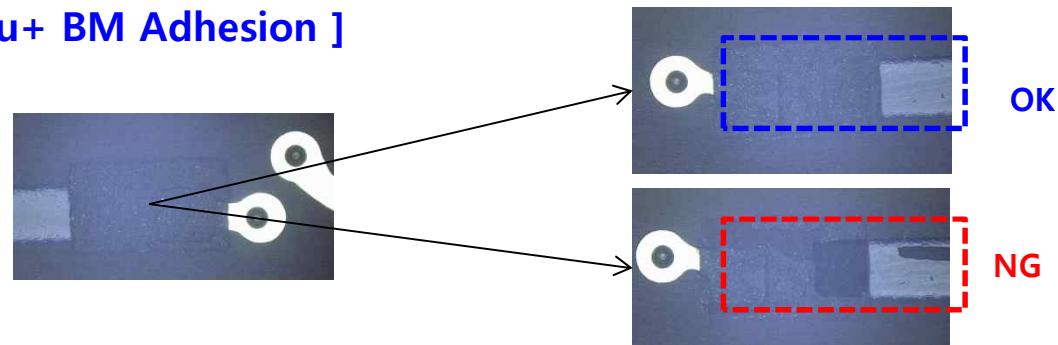
Product Code	Viscosity (Kcps / rpm)	Dry Con. ($^{\circ}\text{C}$ / min)	Sheet Resistance	Materials
PA-FSP-01	50 / 40	100/15(IR)	47m Ω /□ (10.8 μm)	PVDF Glass

09 Screen Printing Ag paste for Pressure Sensor Type

[Pressure Sensor Ag Paste]

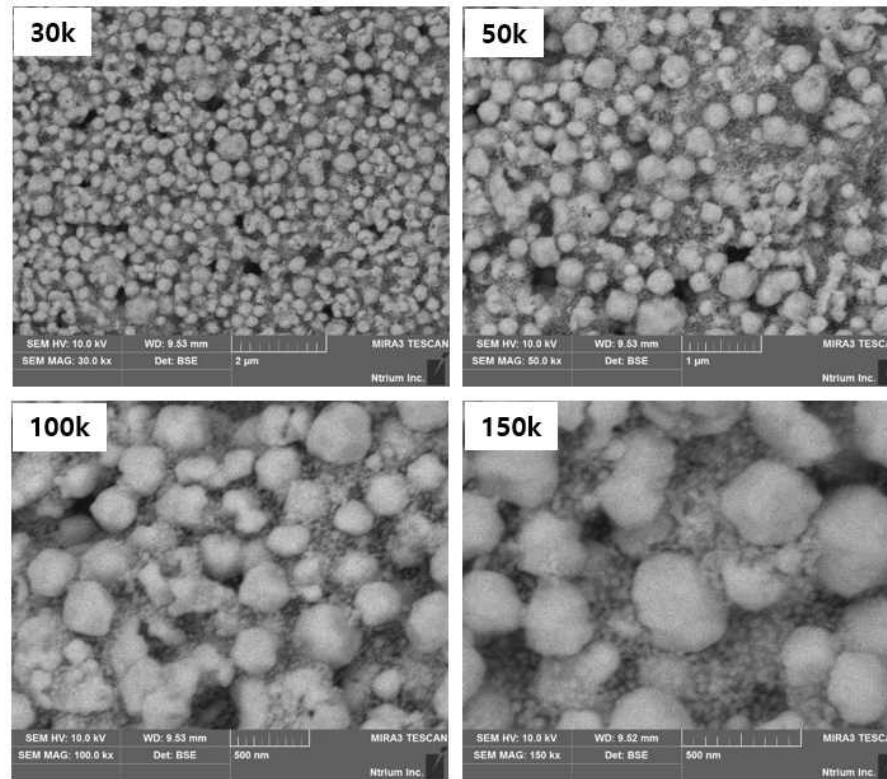


[Pressure Sensor - Cu+ BM Adhesion]



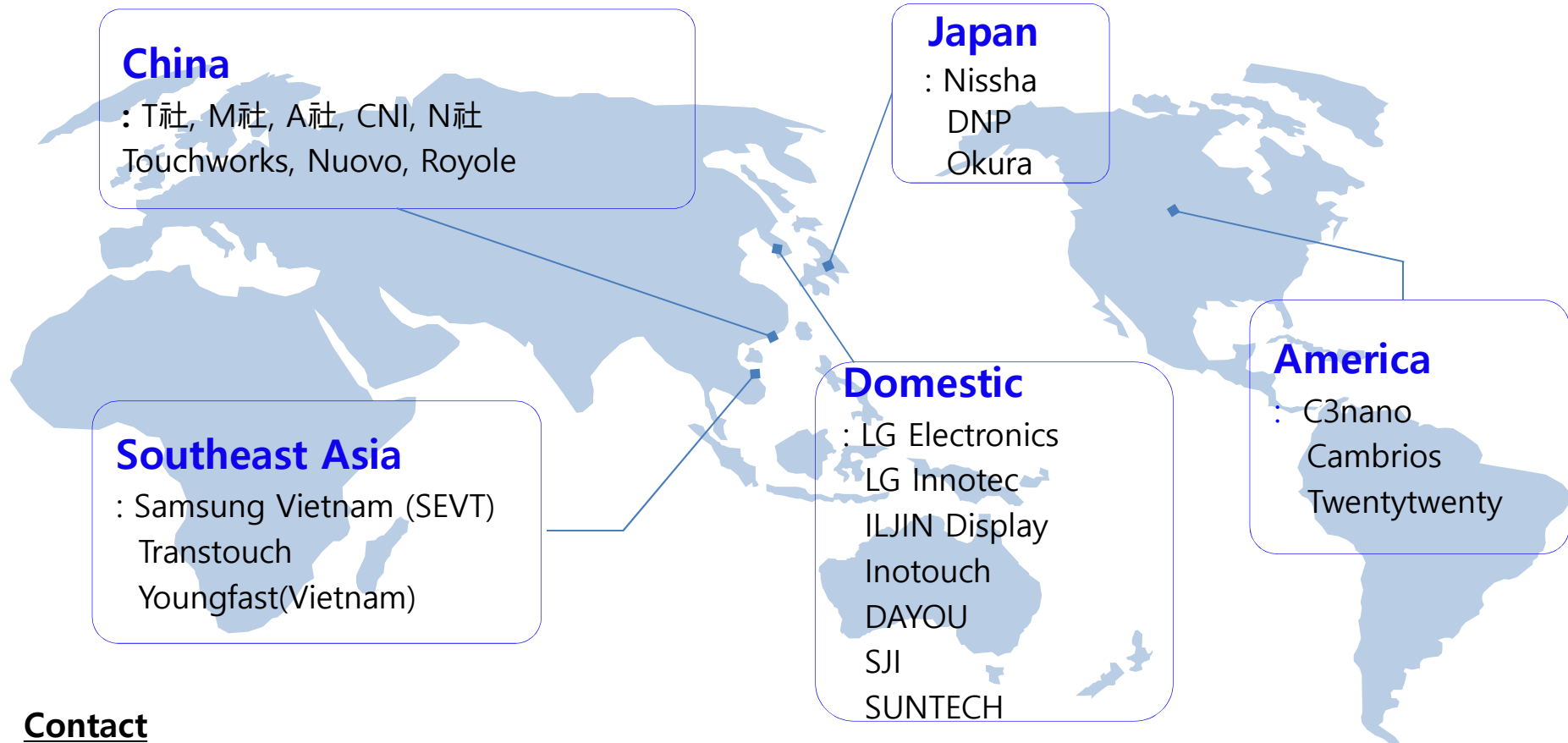
Product Code	Viscosity (Kcps / rpm)	Dry Con. (°C / min)	Sheet Resistance	Materials
PA-STP-7P	9 / 40	130/7(IR)	120mΩ/□ (8 μm)	Cu Metal, BM
PA-STP-1M	80 / 40	130/7(IR)	120mΩ/□ (7 μm)	Cu Metal, BM

10 Low Temperature sintering Ag Paste(Low Resistivity)



Product Code	Viscosity (Kcps / rpm)	Dry Con. (°C / min)	Sheet Resistance	Materials
PA-1501A	30 / 40	150/60	50mΩ/□ (5 μm)	Film

11 Major Customers



Contact

hkyoo@phoenixmat.co.kr