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FUJIKURA KASEI CO.,LTD.

Taking on Challenges and Working Together

Introduction and Business Divisions

Fujikura Kasei produces polymer materials for a variety of applications, developing unique, value-added products based on our decades of accumulated expertise.

DOTITE Electrically Conductive Pastes

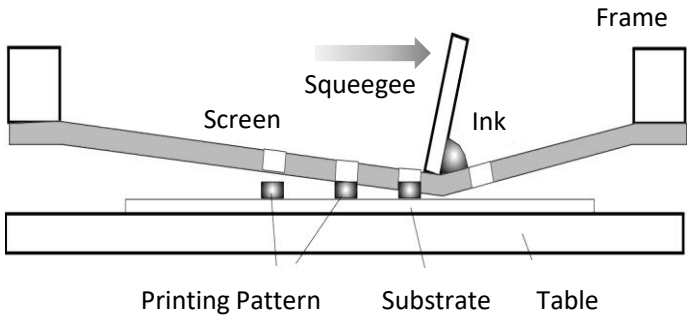
In 1957, we were the first manufacturer in Japan to develop and sell electrically conductive pastes and insulators for electronics under the brand name DOTITE. We have a wide range of inks, adhesives, and EMI shield paints.

This catalogue will introduce some of our current products and latest developments in conductive inks.

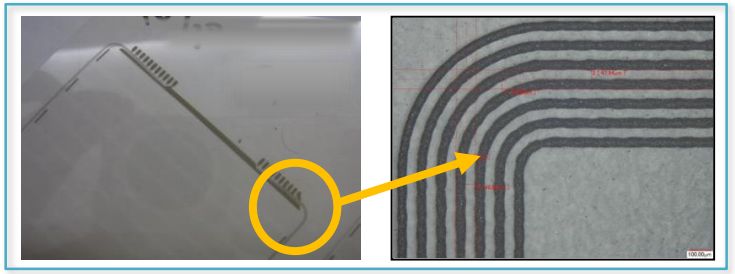
DOTITE – Fine Line Screen Printing

Polyester-based inks for screen printing can be used to form fine line circuitry.

Printing Process:



Use Case: Lead lines for touch panels



- Ultra fine filler and increased viscosity makes L/S: 100/100µm or lower possible.
- Widely used in touch panels for automotive, industrial, and retail applications.

	DOTITE FA-345	DOTITE XA-3512	DOTITE XA-3838
Resin	Polyester	Polyester	Polyester
Curing Conditions ※	150°C, 30 mins.	140°C 20 mins.	150°C, 30 mins.
Resistivity	4.0×10^{-5} Ω・cm	5.9×10^{-5} Ω・cm	2.3×10^{-5} Ω・cm
Line Width (µm)	L/S: 100/100	L/S: 75/75	L/S: 50/50
Substrate	PET, glass	PET, glass, ITO	PET
Storage	Refrigerated, 4 mos.	Refrigerated, 6 mos.	Refrigerated, 4 mos. (prelim.)
Notes	High flexibility	For touch panels	Low resistivity

※ Cured with convection oven. For other curing methods, please inquire

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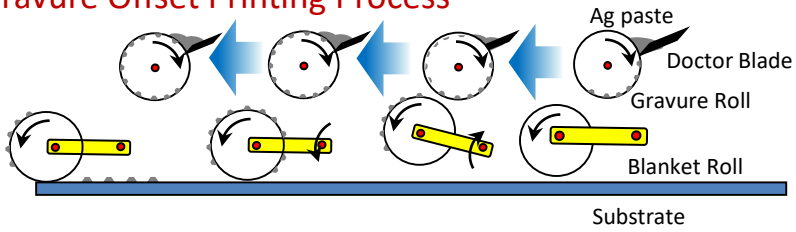
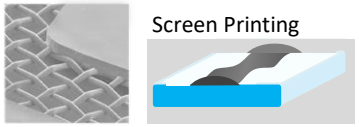
DOTITE – Ultra Fine Line Gravure Offset Printing

Inks for gravure offset printing can be used to form lines with a width of 15µm or less.

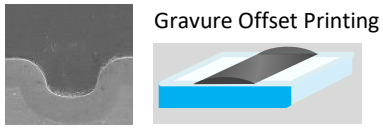
Gravure Offset Printing Process



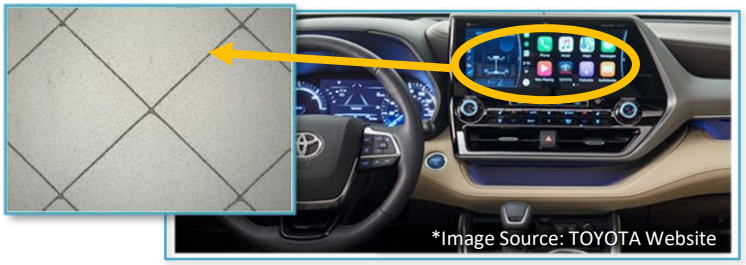
➢ Screen printing results in irregular surface.



➢ The engraved print pattern transfers the ink cleanly with fewer irregularities.



Use Case: Transparent conductive film



➢ Effectively invisible, 7µm lines can form a transparent conductive film.

	DOTITE XA-3609	DOTITE XA-3823	DOTITE XA-3878
Resin	Phenol	Phenol	Phenol
Curing Conditions ※	130°C, 30 mins.	150°C 30 mins.	150°C, 30 mins.
Resistivity	3.0×10^{-5} Ω・cm	3.0×10^{-5} Ω・cm	1.5×10^{-5} Ω・cm
Line Width	L=10~15µm	L=7~10µm	L=5~10µm
Substrate	PET, glass	PET, glass	PET, glass
Storage	Frozen, 1 yr.	Frozen, 3 mos.	Frozen, 4 mos.
Notes	Standard type	Printability, Low visibility	Low resistivity

※ Cured with convection oven. For other curing methods, please inquire.

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DOTITE – Low Resistivity Conductive Inks

Polyester-based inks with improved formulation for high conductivity.

	DOTITE FA-451A	DOTITE XA-3676	DOTITE XA-3851
Resin	Polyester	Polyester	Polyester
Curing Conditions ※	150℃, 30 mins.	125℃ 60 mins.	80℃, 30 mins.
Resistivity	1.7 x 10^{-5} Ω・cm	2.0 x 10^{-5} Ω・cm	2.0 x 10^{-5} Ω・cm
Substrate	PET, glass	PET, PC	PET
Storage	Room temp., 4 mos.	Refrigerated, 4 mos.	Room temp., 4 mos.
Notes	Standard low resistivity	For printing on PC substrate	Low temp. curing; can be pad printed

※ Cured with convection oven. For other curing methods, please inquire.

Use Case: Automotive defroster **(XA-3676)**

Use Case: Automotive film antenna **(FA-451A)**

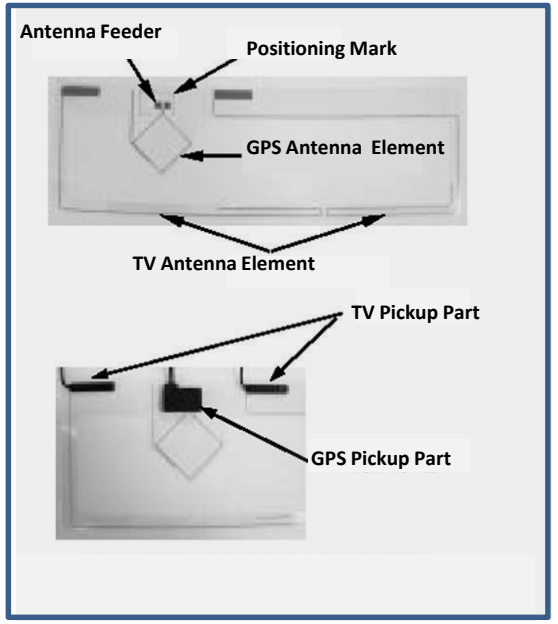

*Image Source: FUJITSU TEN Technical Report

- High conductivity is possible through a careful formulation of silver filler and resin binder.
- Used widely in 5G antennas, IC tag antennas, and similar applications.

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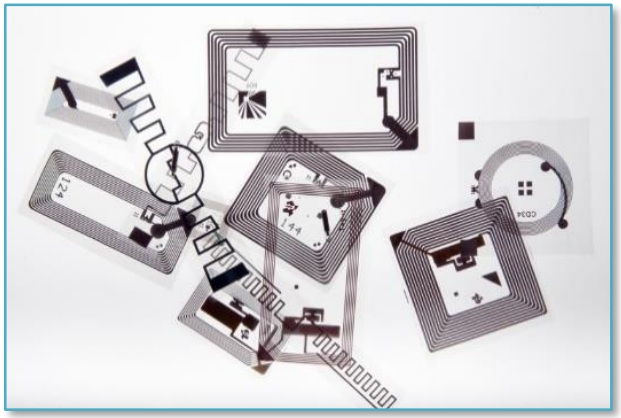
DOTITE – Low Resistivity Sintering Inks

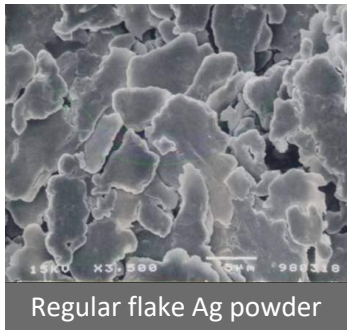
Low resistivity circuits can be achieved with sintering metallic filler.

	DOTITE XA-9565	DOTITE XA-9508	DOTITE XA-9509
Resin	None (Conductive filler only)	None (Conductive filler only)	None (Conductive filler only)
Curing Conditions ※1	130℃, 30 mins.	150℃ 30 mins.	150℃, 30 mins.
Resistivity	9.1×10^{-6} Ω・cm	6.0×10^{-6} Ω・cm	5.3×10^{-6} Ω・cm
Substrate ※2	PET, etc.	PET, etc.	PET, etc.
Storage	Frozen, 4 mos.	Frozen, 4 mos.	Frozen, 4 mos.
Notes	Low cost, Low resistivity	Thin film, Low resistivity	Thick film, Low resistivity

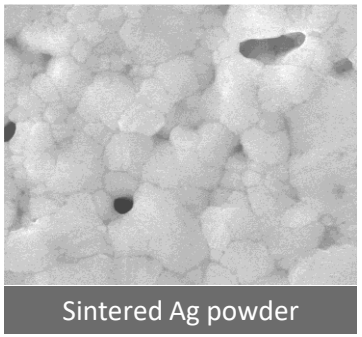
※1 Cured with convection oven. For other curing methods, please inquire.
※2 Use of undercoat to improve adhesion is recommended

Use Case: RFID antenna





Regular flake Ag powder



Sintered Ag powder

- Compared to regular Ag filler that conducts electricity through contact between particles, sintered Ag filler provides much lower resistivity.
- Allows use of screen printing over more complex processing methods such as chemical etching which can reduce the number of production processes and improve efficiency.

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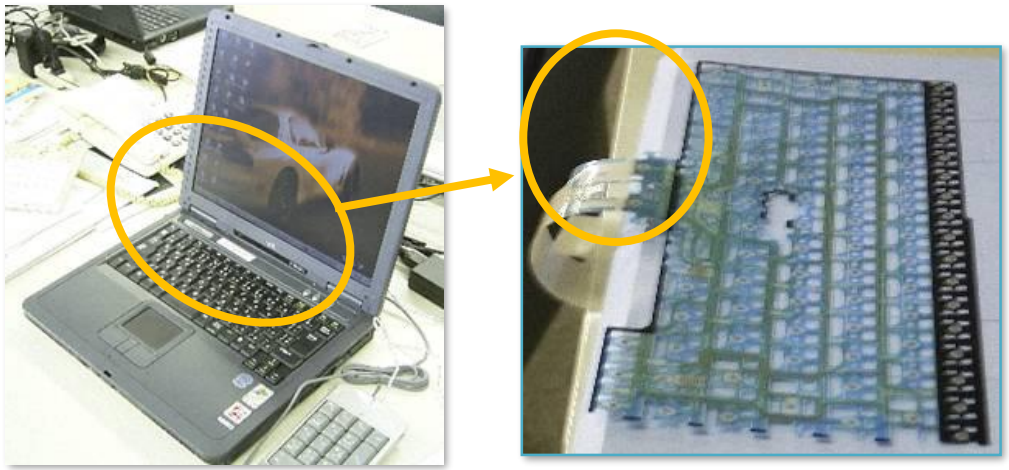
DOTITE – High Flexibility Inks

For printed electronics that require high flexibility.

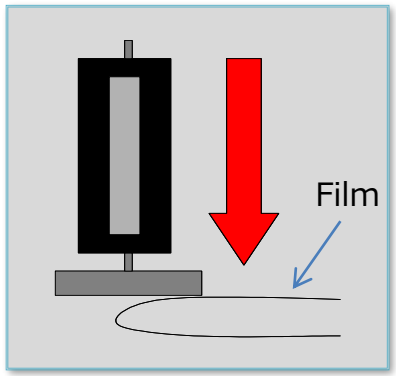
	DOTITE FA-353N	DOTITE XA-3836
Resin	Polyester	Polyester
Curing Conditions ※	150℃, 30 mins.	150℃ 30 mins.
Resistivity	2.9 x 10^{-5} Ω・cm	1.5 x 10^{-5} Ω・cm
Substrate	PET, glass	PET
Storage	Room temp., 6 mos.	Room temp., 3 mos.
Notes	180° bending, High flexibility	Flexible, Low resistivity

※ Cured with convection oven. For other curing methods, please inquire.

Use Case: Membrane switch for laptops (FA-353N)



➢ Widely used in membrane switch applications that require high flexibility.



Bending Test Conditions (FA-353N)

1 test cycle = Inward crease + Outward crease

180° inward crease (5kgf, 5 secs.)
+180° outward crease (5kgf, 5 secs.)

Durable for over 20 cycles

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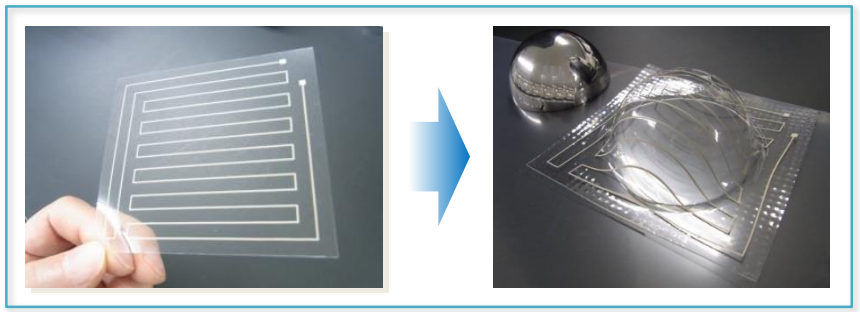
DOTITE – Stretchable and Formable Inks

Stretchable and formable pastes with carbon filler and insulating variations are available.

	DOTITE XA-9521	DOTITE XA-9587	DOTITE XA-3737
Resin	Urethane	Silicone	Polyester
Curing Conditions ※	100°C, 60 mins.	160°C 60 mins.	125°C, 30 mins.
Resistivity	4×10^{-4} Ω・cm	2×10^{-4} Ω・cm	5.3×10^{-5} Ω・cm
Substrate	Urethane	Silicone	PET, PC
Notes	Standard urethane type, used in wearable applications	Standard silicone type	Usable on substrates like PC that are weak to solvent.

※ Cured with convection oven. For other curing methods, please inquire.

Use Case: Formable Circuitry (XA-3737)



- Full stack for printed electronics including conductive ink, carbon ink, adhesive, and insulating overcoat are available.
- Stretchable Ag/AgCl ink for medical applications also available.
- A catalogue featuring our full lineup of stretchable and formable pastes is also available on request

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DOTITE – Additional Materials

In addition to Ag conductive pastes for printed electronics, Ag/AgCl and carbon based inks are available along with non-conductive insulating pastes.

	DOTITE XA-3513	DOTITE FA-333	DOTITE FA-323	DOTITE FC-415	DOTITE FC-435	DOTITE XB-3253	DOTITE XB-3364
Type	Ag/AgCl paste For medical devices ※1	Standard Ag paste	Ag paste for FPC	Carbon paste for protecting Ag circuits	Abrasion resistant carbon paste	High transparency resist	Transparent resist
Resin	Polyester	Polyester	Polyester	Polyester	Phenol	Polyester	Polyester
Curing Conditions ※2	150℃, 30 mins.	120℃, 10 mins.	135℃, 10 mins.	150℃, 20 mins.	150℃, 30 mins.	150℃, 30 mins.	150℃, 30 mins.
Resistivity	1×10^{-4} Ω・cm	3×10^{-5} Ω・cm	3×10^{-5} Ω・cm	2×10^{-1} Ω・cm	5×10^{-2} Ω・cm	-	-
Substrate	PET	PET, glass	PET, glass, PI	PET	PET, glass	PET	PET
Notes	Used in bioelectrodes	Lower temp., Faster drying	Good adhesion to polyimide film	Long-running, widely used, standard type	High abrasion resistance	Environmental resistance, Good transparency	Semitransparent, Flexible overcoat for FA-345

※1 Ag/AgCl ratio variations available

※2 Cured with convection oven. For other curing methods, please inquire.

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