

DryCure Au-J • Ag-J

Conductive Nanoink for Ink-jet Printing

- DryCure have amazing ink stability.
- DryCure can be stably discharged by all types of ink-jet heads.
- DryCure enable you to form crack-free, good quality metal film.

[Property]

Particle Size 15~20nm / Viscosity 4 or 10cps /
Surface tension 30mN/m

[Composition]

Metallic Particle 10wt% / Water and Additives 90wt%
or Metallic Particle 20wt% / Water and Additives
80wt%

[Volume Resistivity]

$5.0 \times 10^{-5} \Omega\text{cm}$ (Au-J), $2.5 \times 10^{-5} \Omega\text{cm}$ (Ag-J),
 $7.1 \times 10^{-5} \Omega\text{cm}$ (Au-JB), $4.2 \times 10^{-5} \Omega\text{cm}$ (Ag-JB),

*dry condition : 120 degrees C, 1h

*substrate : glass

*-JB : nanoink for ink-jet printing containing binder



Product Name	PN	Metal content concentration	Metal Content (g)	volume (mL)	Viscosity (25 deg.C)
DryCure Au-J	0410B	10 wt%	3 / 10 / 25	27 / 90 / 225	4mPa·s
	1010B	10 wt%		27 / 90 / 225	10mPa·s
DryCure Au-JB	0410B	10 wt%	3 / 10 / 25	27 / 90 / 225	4mPa·s
	1010B	10 wt%		27 / 90 / 225	10mPa·s
DryCure Ag-J	0410B	10 wt%	10 / 100 / 1,000	90 / 900 / 9,000	4mPa·s
	0420B	20 wt%		40 / 400 / 4,000	
	1010B	10 wt%		90 / 900 / 9,000	10mPa·s
	1020B	20 wt%		40 / 400 / 4,000	
DryCure Ag-JB	0410B	10 wt%	10 / 100 / 1,000	90 / 900 / 9,000	4mPa·s
	0420B	20 wt%		40 / 400 / 4,000	
	1010B	10 wt%		90 / 900 / 9,000	10mPa·s
	1020B	20 wt%		40 / 400 / 4,000	

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Advantages of C-INK: Comparison with Silver Paste

(1) No deterioration in resistance value; formation of highly reliable patterns

Nanoink silver nanoparticles form a metal bond, so the resistance value does not deteriorate. Since electricity flows through the contact of silver powder in silver paste, the resistance value deteriorates due to oxidation or other factors.

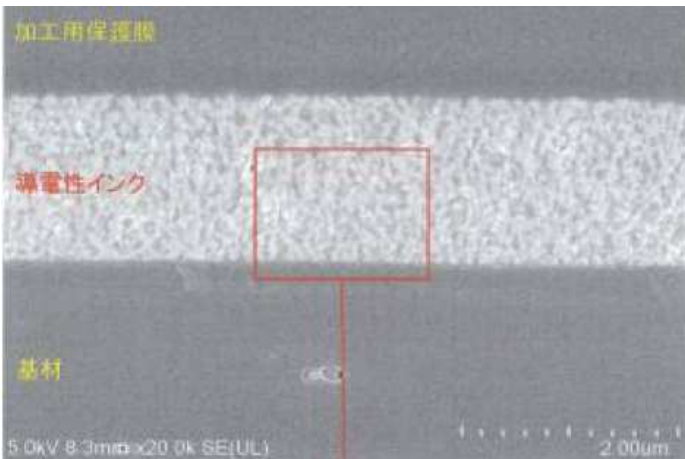


Fig. 1 SEM image of Ag nanoink coating film made by C-INK (after sintering)

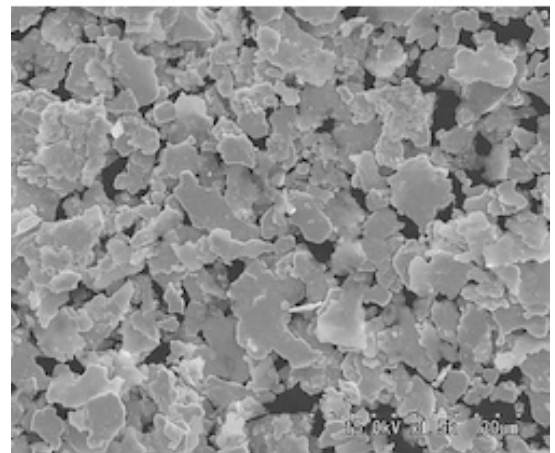


Fig. 2 SEM image of silver paste

(2) Low cost

Since the volume resistance of nanoink is lower by an order of magnitude than silver paste made by other companies, the amount of silver used can be reduced by 1/10

Volume Resistivity Reference Values

C-INK	37 $\mu\Omega \cdot \text{cm}$	(120 deg.C 5min.)
	8 $\mu\Omega \cdot \text{cm}$	(220 deg.C 5min.)
Silver paste	~50 -80 $\mu\Omega \cdot \text{cm}$	



(3) Long ink life

If stored properly, nanoink can be used for 6 months. Silver paste/silver nano ink made by other companies have expiration dates as short as several days to about 3 months.

Electronic and physical properties of DryCure Ag-JB

The following are reference values.

All characteristics vary depending on the substrate material and heating conditions.

Item name		Test conditions	Results	
Mechanical properties	Strength	Number of folding endurance (PI200°C)	Number of bends: 10000 Uses MIT folding endurance tester Clamp diameter: 0.38mm, Bend angle: 135° left and right	Change in conductivity: Less than 20%
		Coating adhesion (PET120°C)	Tape peeling test (former JIS5400 100 mass test) Tape used: Nichiban CT-24 (4.01N/10mm)	100/100 (No peeling)
		Coating strength (PET120°C)	Pencil hardness test (former JIS5400) Pencil used: Mitsubishi Pencil Hi-uni series	Up to 4H hardness endure
Electrical properties		Volume resistivity	120°C × 5min (Ambient atmosphere)	37.1 μΩ · cm
			220°C × 5min (Ambient atmosphere)	8.8 μΩ · cm
			Measuring device: Mitsubishi Analytics Loresta GP mcp-t600	
Shield property		Electromagnetic wave shield characteristics (coating thickness 1 μm)	Improved coaxial tube method Measuring organization: KEC Kansai Electronics Industry Promotion Center	About 50dBm (1~6GHz)
Physico-chemical properties	Thermal property	Heat loss (wt/wt%)	Tg-DTA measurement Weight reduction amount between 150°C and 550°C Measuring device: Shimadzu DTG-60H, etc.	< 6%
	Environmental durability	Humidity resistance (constant temperature and humidity test)	85°C, 95%RH, 1,000 hours	 Note 1)
		Temperature resistance change (cooling cycle test)	60°C ⇄ -20°C, 200 hours	 Note 2)
		Water resistance (washing machine durability test)	Washing * 50 times * Use normal temperature water, other settings comply with SEK regulations	Note 3)
	Basic physical properties	Density (specific gravity)	—	5.1g/cm ³

Note 1) Pass tape peeling test (former JIS5400) after 1000h durability test

Note 2) Tape peeling test (former JIS5400) after 200h durability test Pass

Note 3) Confirm that the film does not come off from the PET film even after 50 washing durability tests (overcoating is desirable to ensure conductivity)