

## Metalon™ Conductive Inks for Printed Electronics

### Overview

Metalon conductive inks, developed by NovaCentrix, capitalize on advanced materials to provide conductivity options for additive manufacturing of **flexible printed electronics** like RFID, smart cards/labels, displays, photovoltaic devices, and advanced packaging.

Utilizing nanoparticles and flakes, Metalon inks are formulated for specific applications and print methods. Variants already developed include **silver inks** suitable for application by inkjet, flexographic printing, and gravure. True **copper inks** are also available for flexographic or gravure application. In conjunction with the PulseForge™ technology also from NovaCentrix, these inks can be applied to substrates such as plastic films, and even paper. The PulseForge process uses brief, extremely high-powered pulses of light from special custom lamps to sinter inorganic inks and films, including Metalon inks, at room temperature. The combination of Metalon and PulseForge processing allows conductivity requirements to be met using thin flexible substrates, and most substrates remain unaffected because of the very short pulse duration.

### Key Features

Metalon inks are designed specifically for use with **low-temperature substrates** including paper, PET, and other plastics including polyethylene film.

Metalon **copper** inks can be printed and cured in an **air environment** and do not require inert or reducing atmospheres.

Metalon inks can be cured within **microseconds** using PulseForge technology and can be used with existing print lines to attain new levels of performance.

Metalon silver and copper inks and PulseForge cure technology can allow existing printing equipment to produce new electronics products, opening new markets and driving higher value.

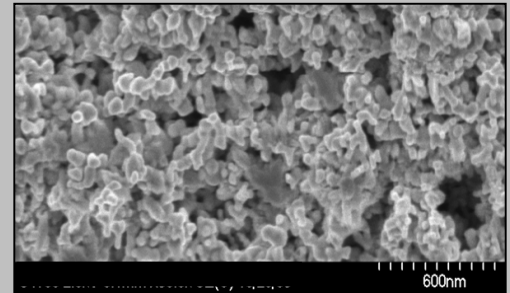
### Performance

Sheet resistances as low as 10 milliohms per square and resistivities as low as 4X bulk have been attained with silver ink. Sheet resistances below 100 milliohms per square and resistivities as low as 10X bulk have been attained with copper ink. Performance varies depending on print method and substrate.

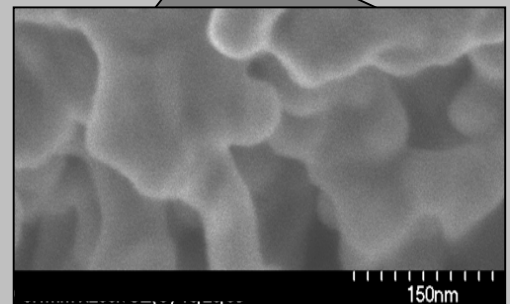
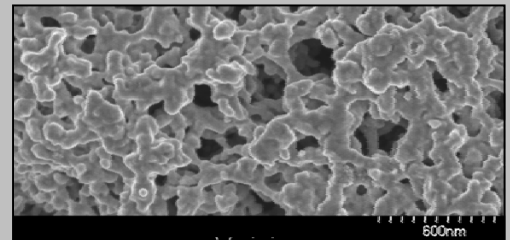
#### Metalon™ JS-011 Ag Inkjettable Ink



#### OC-070 Cu ink before PulseForge™ No conductivity



#### OC-070 Cu ink after PulseForge Resistivity within 10x bulk



## Ink Product Guide

### Sample Metalon™ inks

#### JS-011

An inkjettable, aqueous, nano-silver ink specially formulated for porous paper substrates. JS-011 absorbs into the paper and becomes highly conductive as it dries. Additional curing with thermal or PulseForge equipment will further increase conductivity.

#### FS-066 /FS-067

A stretchable, nano-silver, solvent based ink that retains conductivity with up to 100% elongation. This ink was formulated for polyethylene film, and is also compatible with other plastic substrates. FS-066 is formulated for spray deposition, and FS-067 is for gravure deposition.

#### OS-060

A highly conductive aqueous-based silver ink formulated for plastic substrates. OS-060 can be deposited by flexographic and gravure print processes.

#### OC-070

An aqueous-based copper ink formulated for flexographic and gravure printing onto plastic substrates. OC-070 can be cured with PulseForge equipment in ambient environments, becoming highly conductive with no need for special O2 purged furnaces.

#### New inks under development

Metalon inks are optimized for specific application requirements, including print method, substrate, and target performance. NovaCentrix is actively developing new ink products to meet the needs of our customers.

### Product Selection Guide

Product Description	JS-011 Ag ink	JS-014 Ag ink	FS-066 Ag ink Stretchable 100%	OS-60 Ag ink (development)	OC-70 Cu ink (development)
Print method	Drop-on-Demand Inkjet	Drop-on-Demand Inkjet	Gravure, Spray	Flexographic, Screen	Flexographic, Screen
Substrates	Photo paper Copier paper	PET Glass, Si TCO coatings	Polyethylene film Plastics	PET Photo paper Copier paper	PET Photo paper Copier paper
Performance*					
Stretch %	NA	NA	0%      100%	NA	NA
Microns	0.3	0.6	0.8      0.3	1.4	1.8
Ohm/sq	0.20	0.12	1.3      57	0.18	0.05
( X bulk Metal)	4	4.5	57      231	16**	5**

**Contact us today to learn more.**

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