

## Piezo electric ink



## PIEZOELECTRIC INK

**MAGRON's PEInk01NP<sup>®</sup>** is a screen printable piezoelectric ink. It is produced through a high-quality process in order to exhibit a unique set of inherent piezo and pyroelectric properties. Various printing techniques can be used in a wide range of substrates. After printing, the ink requires annealing and poling, to make it functional.

**GPEInk01NP<sup>®</sup>**, MAGRON's green piezoelectric ink is also available. This ink presents the same characteristics as PEInk01NP<sup>®</sup> and is produced using a green solvent.

### INK FEATURES

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|----------------------------|--|
| ✓ PVDF-TrFe based          | ✓ Piezoelectric  |
| ✓ Good actuation power     | ✓ Flexible   |
| ✓ High dielectric constant | ✓ Easy production process  |
| ✓ Easy screen printable    | ✓ Capable of detection of pressure, impacts, accelerations and deformations in the substrate |
| ✓ Of easy cleaning         |  |

### INK PROPERTIES

Apparency	Clear/Transparent
Cure processing	Thermal cure
Solid content (%)	25%
Viscosity	4 000 – 8 000 cP

### PIEZOELECTRIC/PYROELECTRIC VALUES

Piezoelectric coefficient d <sub>33</sub> (pC/N)	18 - 23
Pyroelectric Coefficient ρ (μC/m <sup>2</sup> .K)	- 23
Remnant Polarization P <sub>r</sub> (mC/m <sup>2</sup> )	80

### DIELECTRIC VALUES

Dielectric const. range @1 KHz, 25 °C	11.5
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Coercive field (KV/cm)	450
Poling min. (KV/cm)	600
Poling max. (KV/cm)	1000

## HANDLING GUIDELINES

Processing	Vigorously stir with a spatula
Printing methods	Screen printing, doctor blade, inkjet, spray
Mesh count, warp (n/cm)	60-90
Clean-up solvent	MAGRON's cleaning solvent <b>Clear100NP</b>
Substrates	Glass, PET, PC, paper (...)
Storage	Should be kept well sealed in its container, away from direct sunlight and stored at a controlled temperature above 20 °C
Shelf-life	Ink in an unopened container has a recommended shelf life of 3 months from the date of delivery

## ANNEALING

Annealing above Curie transition temperature is required as the following procedure:

- Temperature: 135-140 °C
- Duration: 15 minutes

This step is recommended in order to increase polymer crystallinity properties and final sensor performance.

## POLING

The ink must be poled to enhance the piezoelectric properties through a Corona or Contact method. The process is made by applying an electric field with a voltage above the coercive field.

Polling can also be performed while heating the sample and applying a constant electric field.

Typical poling values:

- Voltage: 50 V /  $\mu\text{m}$
- Temperature: 80-120 °C
- Duration: 60-90 minutes

Please ask for the poling processing guide at [magron@magron.co.kr](mailto:magron@magron.co.kr)