PIEZOELECTRIC INK

Nanopaint's PEInk01NP® 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®, Nanopaint's green piezoelectric ink is also available. This ink presents the same characteristics as PEInk01NP® and is produced using a green solvent.

INK FEATURES

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

INK PROPERTIES

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

PIEZOELECTRIC/PYROELECTRIC VALUES

Piezoelectric coefficient d33 (pC/N)	18 - 23
Pyroelectric Coefficient ρ (μC/m^2.K)	- 23
Remnant Polarization P_r (mC/m^2)	80

DIELECTRIC VALUES

Dielectric const. range @1 KHz, 25 °C	11.5

NanoPaint, Lda.
IBS – Institute of Science and Innovation for Bio-sustainability
Universidade do Minho, Campus de Gualtar, Room 1.7, 1º Floor
4710-054 Braga
Portugal

Website: www.nanopaint-tech.com
Email: info@nanopaint-tech.com

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	Nanopaint's cleaning solvent **Clear100NP**
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 ºC
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 / µm
- Temperature: 80-120 °C
- Duration: 60-90 minutes

Please ask for the poling processing guide at info@nanopaint-tech.com.

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