Applied Nanotech, Inc.
a PEN Inc company

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Ni-IJ70-30

Nanonickel Ink

ANI's Ni-IJ70-30 is a nickel nanoparticle ink suitable for printing highly conductive lines and patterns for applications in the printed electronics and solar industry. Ni-IJ70-30 can be printed and cured to form conductive patterns on substrates such as silicon, ceramics, and Kapton. The Ni-IJ70-30 contains nickel nanoparticles ranging in size from 20-100nm. Ni-IJ70-30 can be printed by inkjet printing and aerosol jet printing techniques. Ni-IJ70-30 ink is formulated to print narrow conductive electrodes and to form a low contact electrical resistance for solar cells. Printed nickel ink on plastic substrates can be photosintered in atmosphere to produce conductive nickel traces.

Typical properties

Part number	**Ni-IJ70-30**
Particle Size	**20-100 nm**
Resistivity	**20-50 μΩ-cm**
Solid Content	**30 wt%***
Viscosity	**16-25 cP****
Surface Tension	**26-31 mN/m**
Solvent	**Organic**

* Available from 30 wt%
** Measured at 10rpm and 25C with Brookfield LV-I+ viscometer

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Application Notes:
Ni-IJ70-30 Nanonickel Ink

Description

ANI's Ni-IJ70-30 is a nickel nanoparticle ink suitable for printing highly conductive lines and patterns for applications in the printed electronics and solar industry. Ni-IJ70-30-30 can be printed and sintered to form conductive patterns on substrates such as silicon and polyimide. Ni-IJ70-30 can be printed by inkjet and aerosolized jet techniques.

Storage and Shelf Life

Ni-IJ70-30 ink should be stored in a tightly sealed, leak-proof container at 3-10°C. Storage in freezers is not recommended. Ni-IJ70-30 can be stored up to 3 months.

Safety and Handling

When working with Ni-IJ70-30 ink, use adequate ventilation and wear appropriate protective gear. Ni-IJ70 can cause eye and skin irritation. The following precautions should be taken when handling Ni-IJ70-30 ink:

- Read the Material Safety Data Sheet (MSDS)
- Avoid prolonged breathing of vapor
- Use appropriate safety equipment such as gloves and eye protection
- Wash hands thoroughly after handling
- Keep the paste container closed when not in use to prevent drying and spilling

Processing Procedures

Pre-processing

- Soft-settling is expected with Ni-IJ70-30 ink. The Ni-IJ70-30 ink requires manual agitation (mix or stir) followed by sonication for 15 minutes.
- After sonication, the ink should be filtered using a 1 micrometer pore size glass fiber filter (PALL Acrodisc® 25mm 4523-T recommended).

Printing

- Printing has been demonstrated using inkjet, aerosolized jet, and wire rod drawdown. Conditions will vary based on technique and substrate.

Drying

- Printed ink can be dried at 100°C for 30 minutes in ambient atmosphere.

Sintering

- Ni-IJ70-30 ink on polyimide can be photosintered using a xenon arc-discharge lamp system. Conditions will vary based on substrate.
- Ni-IJ70-30 ink can be thermal sintered at temperatures >350°C in a reducing atmosphere (H_2 = 4% in N_2) for 20 minutes.

Clean-up

- Follow appropriate cleaning procedures for equipment used to dispense Ni-IJ70-30 ink. Excess ink can be removed with ethanol, IPA, or acetone.

Photonic Sintering - Conductive Copper Ink

Putting you in Charge

XENON's high energy S-2100 Pulsed Light system has been proven to rapidly sinter ***Applied Nanotech, Inc.*** copper nanoparticle ink for applications in the printable electronics and PCB applications.

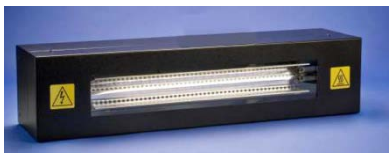
Key Specifications – Model S-2100

- Max radiant pulse energy 11 J/cm^2 at wavelengths of 190 nm to 1100 nm
- Delivers high average pulse power up to 3.7 kW/cm^2
- Ease of programming pulse energy, duration and sequencing using operator controller mounted in the systems electronics rack.
- Programmable pulse duration from 100 to 3000 μs
- Programmable pulse energy from 100 to 3,000 Joules
- Detached robust, air cooled lamp housings containing lamp, reflector and air filters.
- Storage and recall of all pulse settings with timing enables quick return to pulse recipes developed by operator.

XENON's S-2100 Pulsed Light sintering system provides the researcher the flexibility to easily program energy delivered to a target. Selecting from available lamp housings, such as the linear lamp model LH-840, (top photo below) or the spiral lamp model LH-910, (bottom photo below) provide unique exposure areas and energy profiles.

Enabling your success in printed electronics

The S-2100 is designed to support both research and low volume manufacturing for sintering of silver nanoparticle inks on low temperature substrates such as PET. This system is offered with a range of options which allow you to tailor the system to your specific sintering application.



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