



NANO INK AX JP-6n

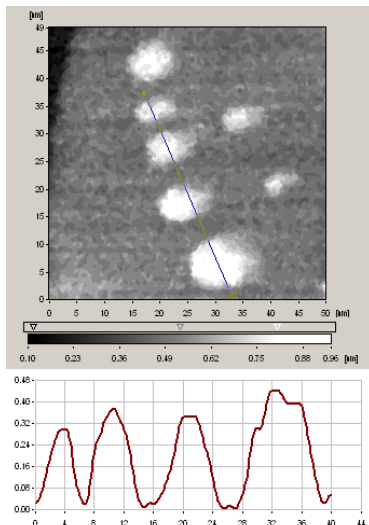
CONDUCTIVE INK FOR JET PRINTING TECHNOLOGY

- * **ELECTRICALLY CONDUCTIVE INK FOR INK-JET APPLICATIONS**
- * **VERY HIGH ELECTRICALLY CONDUCTIVE VALUE**
- * **THE HIGHEST UNIFORM FLUID PROPERTIES**
- * **INK WITH NO SEDIMENTATION PROPERTIES**

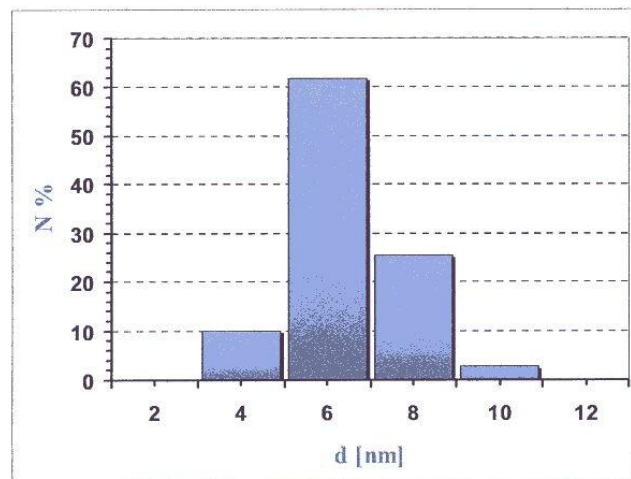
GENERAL DESCRIPTIONS:

Ampox MC **NANO INK AX JP-6n** is single component, electrically conductive nano-silver filled ink. This ink is especially prepared for Ink Jetting technique applications. As a filler is the highest purity silver powder with particles size range as 3 - 7 nm diameters. This extremely small silver particle size is a reason of very unique ink features – it's properties are as close as possible to “molecular fluid” type. Consequences this is that ink doesn't show any sedimentation or agglomeration phenomena's – and all physical properties are very stable during long period of time what is the most important for safe use by Ink-Jet techniques.

NANO INK AX JP-6n has very high and stable electrical conductivity near value of pure silver. Ink nature (connected with molecular fluid properties) is perfectly homogeneous – fully uniform silver concentration in whole ink volume. This is also reason for very good repeatability of resistance and dispensed shapes (dots, lines, etc.)



Nano Silver TEM Picture with Crossection.



Histogram of Ampox MC Nano Silver for NJP-6F Ink.

Application each type of ink with nano silver is connected with two major mechanisms – first “curing” (or better drying) process and after this, sintering nano size silver particles is necessary. This second step is very important for future stable properties. Several different method can be used – important is only supplying energy to silver for example by heating or laser treatment.

NANO INK AX JP-6n is for very high-speed technological process and is possible to occur extremely small sizes of dots or lines (see attached pictures).

SPECIFICATIONS:

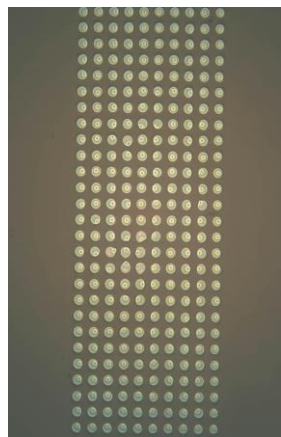
Number of components	One
Consistency	Very low viscous ink
Colour	Dark brown to black
Percentage of silver (inside ready paste)	40 – 60 % (<i>actual 45%</i>)
Viscosity	7.5 – 10.5 mPas (*)
Thixotropy index (1/10 rpm)	~ 1.0
Surface tension value	28.5 – 32.5 dynes/cm
Curing conditions	(190 – 230) °C – 60 min.
Recommended curing & sintering conditions in convection oven	(220 – 230) °C – 60 min.
Storage	2 months in refrigerator in temp. less 15°C (do not keep it in temp. below 5°C)

(*) - Brookfield LVDVII + CP; 100 rpm; 20°C.

TECHNICAL PROPERTIES (*):

Electrical resistivity	$(4 - 6) \times 10^{-6} \Omega\text{cm}$
Specific gravity	1.1 – 1.3 g/cm ³
Adhesion test	passed

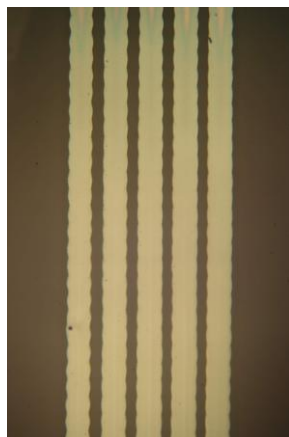
(*) - Typical value for number of tests.



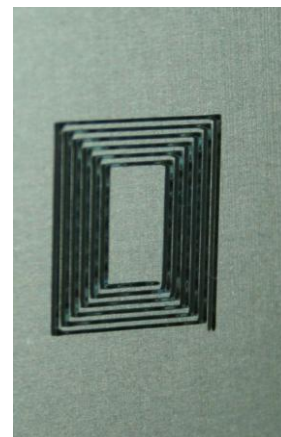
Nozzle 34 microns



Nozzle 66 microns

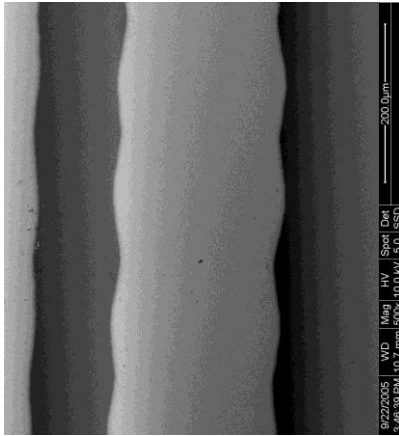


Nozzle 66 microns

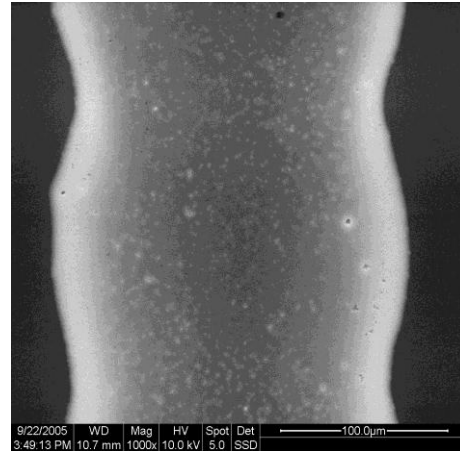


Printed antenna

Lines nozzle diameter on the pictures is 66 microns and line thickness after fully curing (and sintering) is less 30 microns.



Line SEM picture x 500



Line SEM picture x 1000

Courtesy of TNO Industrial-Eindhoven

As is possible to observe with SEM pictures above - **NANO INK AX JP-6n** after fully “curing” process is perfectly uniform what allowed to reach the best and stable properties (similar to pure metal properties).

ATTENTION:

1. Product is ready for use, but sometimes should be mixed before use. Do not shake it because bubbles of air can occur. ***INSURE NANO INK AX JP-6n IS AT ROOM TEMPERATURE WHEN YOU WILL START WORKING WITH.***
2. “Curing” temperature and time is important for nano silver sintering reason. Use ink with adequate ventilation.
3. Use latex gloves for protection your hand. Nano silver is difficult for removing with its' very small size silver particles reason.
4. Avoid skin and eye contact. If ingested, consult a physician immediately.
5. Do not keep Ink inside printing dispenser reservoir when it doesn't work a long of time.
6. Clean by alcohol, MEK or other suitable solvents.

This information is based on data and tests believed to be accurate. **AMEPOX MC** makes no warranties (expressed or implied) as to its accuracy and assumes no liability in connection with the use or inability to use this product.

(nano ink jp-6n)