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Nanocrystalline Alloy (9001)

Magnetic Metals Nanocrystalline (material code: 9001) is composed of 82% Iron, balanced with Silicon, Boron, Niobium, and Copper. This is a high-flux alloy with very low coercivity and power loss over wide range of frequencies. For these reasons this material is a better-performing substitute for 80% Nickel. The applications include high frequency transformers, current transformers, noise filters, pulse transformers and magnetic parts for Switching Mode Power Supplies, chokes, saturable reactors, etc.

MAGNETIC PROPERTIES

B _m (kGauss)	B _r /B _m	H _c (A/m)	Resistivity (μΩ-cm)	Curie Temp (°C)	Density (gm/cm ³)	Thickness (inches)	S.F.
12.0 – 13.5	>.85 (square loop) .60 (round loop)	.04	120	570	7.3	.0007	.75

NAMLITE® COATING is a MMC proprietary method used to reduce eddy currents at high frequency. As frequency increases, the isolation between laminations (material coating) becomes critical. For applications >50 kHz, Namlite coating is applied to 9001 material to reduce the eddy current losses of this already thin material.

Permeability

Flux Density	Frequency	With Namlite	Without Namlite
100 Gauss	1 kHz	40,000	70,000
100 Gauss	100 kHz	20,000	15,000

Core Loss

Flux Density	Frequency	With Namlite	Without Namlite
1000 Gauss	10 kHz	.17 W/lb	.15 W/lb
1000 Gauss	100 kHz	6 W/lb	8 W/lb

PART NUMBERS FOR NANO 9001 CORES:

- Toroidal core:** xxxx – P – 9001 (for regular products / operating frequency < 50kHz, plastic case)
xxxx – P – 9001 – P (with Namlite coating , for pulse applications or operating frequency > 50 kHz, plastic case is best to preserve electrical properties)

Magnetic Metals is processing 9001 nanocrystalline material for round loop applications. For square loop applications, customers should use 9101 amorphous material for economical reasons; however, we can still process for square loop if required.

- **Cut core:** MMN – xxxx (single phase)
MTMN-xxxx (three-phase)

For cut cores, Magnetic Metals can process material for high frequency applications with Namlite coating.

Currently, we are manufacturing core designs with strip widths (“D” dimension) up to 5.6”, and even larger with several cores stacked in this dimension.

Note: The soft magnetic properties on this datasheet were compiled from empirical data, using standard manufacturing procedures and are indicative of results from these standard processes.