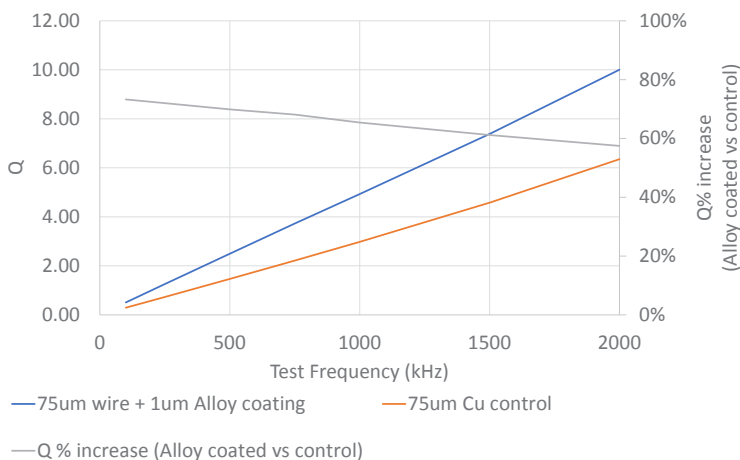


XENERGY®

Nanostructured Soft Magnetic Alloy for Wireless Data and Power Applications

As demand for faster, more efficient wireless charging grows, traditional materials often fall short. XENERGY is a cutting-edge, nanostructured nickel-iron-cobalt alloy that enhances the performance of wireless charging coils and other high-frequency applications. XENERGY's unique nanostructure is achieved through Xtalic's proprietary alloy design and pulse electrodeposition techniques. By applying a thin layer of XENERGY to fine-gauge copper wire, engineers can increase inductance, lower AC resistance and optimize the magnetic properties of inductive coils. This results in a notable boost in efficiency and performance, particularly in wireless charging applications where minimizing energy loss and heat is crucial.

Q as a function of frequency:
1m straight wire test format



Measured on 75um wire, XENERGY delivers +20-200% increase in inductance, which leads to enhanced coil efficiency.

Benefits

Increased Inductance

XENERGY demonstrated wire inductance boost of up to 200%, enabling faster, more efficient wireless charging..

Improved Quality Factor

Achieved 50% greater Q in inductive coils, leading to faster charging times and reduced heat.

Reduced AC Resistance

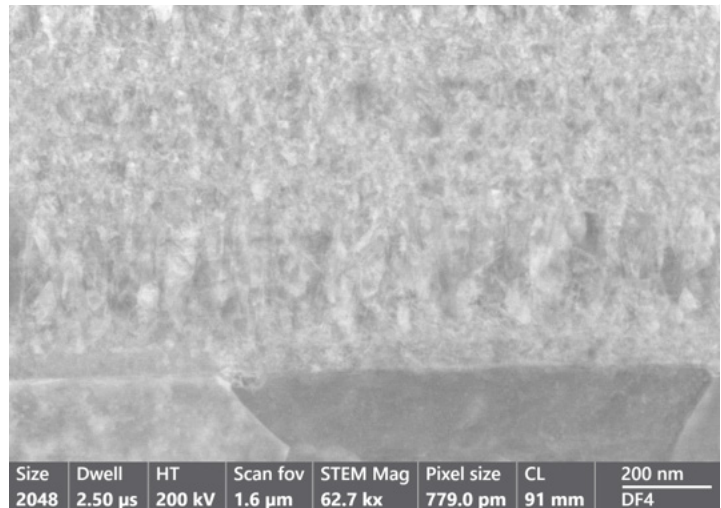
Proven lower AC resistance by 50%, improving energy efficiency in high-frequency applications.

Thin, Stable Coating

With thicknesses ranging from 0.1 to 5 microns, XENERGY's coating adds minimal weight and size to your components, allowing for sleek, compact designs.

Broad Application Range

XENERGY is ideal for applications requiring high-performance soft magnetic materials, including wireless charging, medical devices, and high-frequency inductors.



Cross-section image of XENERGY coating showing the nanocrystalline structure.

Magnetic

- Permeability $\mu > 20$
- Tan δ (loss) at frequency: low
- Inductance boost: up to 200%

Electrical

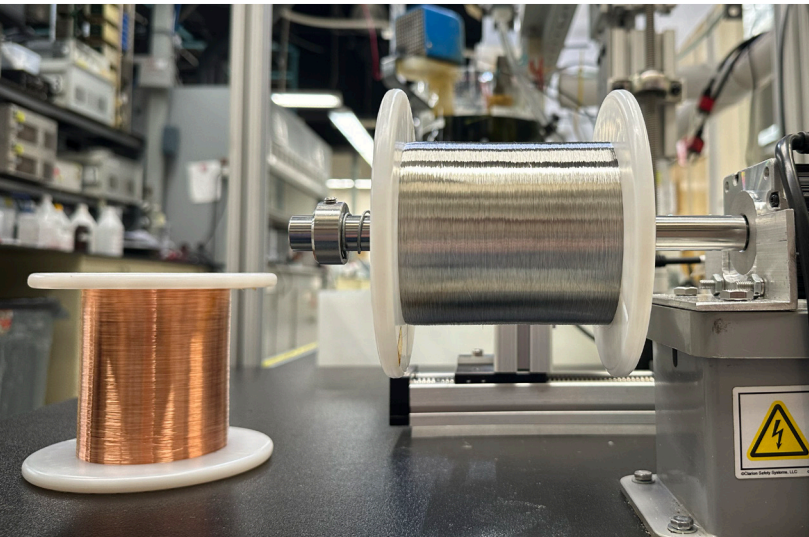
- DC resistivity $\sim 20\text{-}500 \mu\Omega \text{ cm}$ (selectable)
- AC resistivity drop at high frequency

Typical plating layer parameters

- Plating Temperature: 35-40 C
- Plating Line Speed: Proven to 120 m/min
- Current Density: 150-400 mA/cm²
- pH: 2-3

Typical Coating

- Thickness 0.1 – 5 μm
- Alloy composition: Ni-Fe-Co-X



Manufacturing Readiness

Our R&D labs in Marlborough, MA, have plating lines for sampling and small-batch production. Additionally, we can produce fully coated and sealed wire for customer use via our strategic partners. To date, over hundreds of thousands of km of XENERGY-coated wire has been produced. With flexible coating options—from reel-to-reel production to dielectric coating—XENERGY can be tailored to meet your product's specific needs.

Consumer Electronics

Boosts charging efficiency and reduces heat generation in smartphones and tablets.

Medical Devices

Enhances the performance of inductive components in portable medical equipment that require consistent power.

High-frequency Inductors

Applied in devices like NFC (Near Field Communication) and RF (Radio Frequency) technology.

