

ENhanced HPO

**Defect-Free High Phosphorus
Optical Grade Electroless Nickel**

Quality Finishing and
Support Operations.
Since 1960.



Product Description

- ▶ Optical grade electroless nickel plating applied under strict process control regimen employing advanced stabilizer and unique buffering technology
- ▶ High phosphorus, typically 11-13% by weight phosphorus, offering optimum combination of lubricity and surface quality
- ▶ Yields deposit ideal for single-point diamond turning or optically polishing to less than 10 angstrom RMS
- ▶ Ultra-smooth surface free of inclusions, pits or protrusions on deposits in excess of 200 micrometers (~ 8 mils)

Typical Physical Properties

Composition:	Nickel: 90 - 88%
	Phosphorus: 10 - 12%
Structure:	Amorphous, crystalline-free
Density:	7.85 grams/cm ³
Microhardness:	550 HVN ₁₀₀ As-deposited 900 HVN ₁₀₀ Heat Treated
Electrical Resistivity:	50 - 100 microhm-cm
Coefficient of Thermal Expansion:	13 – 15 µm/m/°C
Thermal Conductivity:	0.011 - 0.014 cal/cm/sec/°C
Magnetic Properties:	Non-magnetic
Melting Point:	890°C (eutectic)
Ductility:	Passes ASTM B-489
Wear Resistance:	15 – 22 TWI As-deposited 4 – 8 TWI Heat Treated

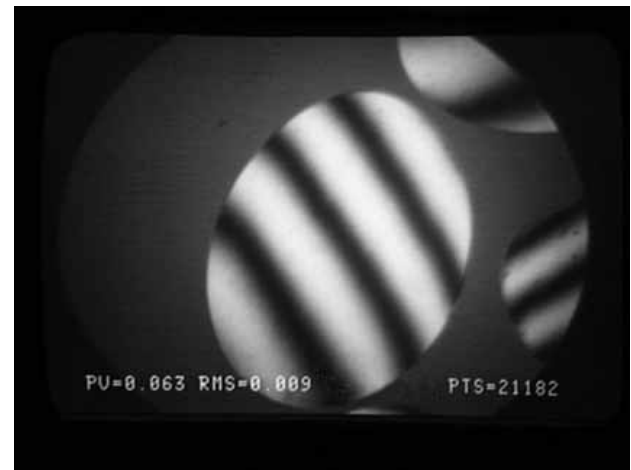
TWI = Taber Wear Index mg / 1000 cycles using CS-10 wheels



On mirror block molds used in making data storage devices such as CD's, optical grade electroless nickel is the industry standard to ensure flatness within millionths of an inch, no orange peel or edge pull back. Specialized chemistry and rigorous process control are essential to produce such defect-free deposits.

Summary

Anoplate's ENhanced HPO offers optical manufacturers high quality, thick, optical-grade electroless nickel deposits that are free from pits, inclusions and protrusions. During subsequent diamond turning ENhanced HPO's outstanding lubricity results in uniform chip formation and extended tool life.



Laser interferometer pattern from optical surface; the degree of waviness in the pattern and the distance between bands provides a quantitative scale for optical worthiness. Following diamond turning, Anoplate's ENhanced HPO provides such optical quality.