



Electroless Nickel/ Silicon Carbide Specifications

TWR's Electroless Nickel/Silicon Carbide process consists of suspending Silicon Carbide sub-microns particles into an electroless nickel solution obtaining a layer where these submicrons particles are homogenously mixed in the final codeposit. The result is a co-deposit with an high surface hardness, due to the presence of silicon carbide particles even on the surface, and at the same time continues to exert its protective effect by its electroless nickel layer. The result is an important resistance to wear and corrosion.

This Co-deposit is based on the same principle of the Electroless Nickel plating, so the final thickness is absolutely homogeneous, avoiding any final grinding. In addition, NiSiC layer is continuous and uniform on all surfaces presenting the same characteristics throughout its extension. NiSiC is used in applications requiring an high abrasion resistance, low coefficient of friction and corrosion resistance. Rivaling hard chrome plating, TWR has achieved ENSC taber wear test results with an average TWI of 3.1. As with EN/PTFE, the silicon carbide particles are distributed throughout the entire nickel matrix, continually exposing carbide particles as the plating is worn.

PROPERTIES

Nickel Content: 91%-93%

Phosphorus Content: 7%-9%

Internal Stress: neutral to compressive

Tensile Strength: > 700 MPa

Elongation: 2% permanent strain

Modulus of Elasticity: 200 GPa (2.8 X 10⁸ psi)

Density: 7.75 g/cm³

Melting Point: 880 oC (1620 oF)

Adhesion Strength: 140-400 MPa (20-60 kpsi), depending on substrate

Hardness:

- **As Plated:** 490-515 VHN100 (49-50 Rockwell C)

- **Heat Treated:** 1000-1100 VHN100 (65-70 Rockwell C)

These reading are for the electroless nickel, not including the silicon carbide.

RoHS & ELV requirements for cadmium <100ppm, no mercury and lead <1000ppm are met by this coating

All statements, technical information and recommendations contained herein are based on information and tests we believe to be reliable. The accuracy or completeness thereof is not guaranteed. Since conditions of use are outside our control, user shall, before using, determine the suitability of the product for his intended use and user as.

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