

## NIPLATE® 500

### High Phosphorus Electroless Nickel

Niplate 500 is a high-phosphorus electroless nickel plating (10-13% in P). It is preferable to other Niplate coatings in case of contact with foods and when resistance to aggressive chemical agents is required.



### EXCELLENT CHEMICAL AND CORROSION RESISTANCE

Thanks to the high chemical resistance of the coating and complete surface covering, the pieces treated with Niplate 500 are protected against corrosion and aggressive chemical substances.

### UNIFORM THICKNESS

Uniform and constant thickness over the entire surface, including holes, ideal for precision mechanical engineering pieces with reduced tolerances.

### APPLICABLE ON VARIOUS METALS

All the most common alloys used in mechanical engineering can be coated: iron, copper and aluminium alloys.

## TECHNICAL SPECIFICATIONS

### COMPOSITION

Ni 87 ÷ 90 %

P 10 ÷ 13 %

Ni-P alloy, high phosphorus electroless nickel plating

### APPLICABLE STANDARDS

#### PRODUCT TECHNICAL STANDARDS

ISO 4527 | NiP(11)

ASTM B733 | Type V

#### NSF 51 CERTIFICATION

✓ Certified NSF 51 – Food equipment material

#### ROHS CONFORMITY

✓ RoHS conform. No restricted-use substances beyond maximum tolerated concentrations

#### REACH CONFORMITY

✓ REACH conform. No SVHC in quantities greater than 0.1% by weight.

## COATABLE METALS

IRON ALLOYS	PRE-TREATMENT	ADHESION	CORROSION RESISTANCE
Carbon steel	-	★ ★ ★ ★ ★	★ ★ ★ ★ ☆
Stainless steel	Sandblasting	★ ★ ★ ★ ☆	★ ★ ★ ★ ★
Case-hardened steel	Sandblasting	★ ★ ★ ★ ☆	★ ★ ★ ☆ ☆
Nitrided steel	Sandblasting	★ ★ ★ ☆ ☆	★ ★ ★ ☆ ☆
COPPER ALLOYS			
Brass, Bronze, Copper	-	★ ★ ★ ★ ★	★ ★ ★ ★ ★
ALUMINIUM ALLOYS			
Wrought alloys	-	★ ★ ★ ★ ☆	★ ★ ★ ★ ☆
Foundry and die-casting alloys	-	★ ★ ★ ★ ☆	★ ★ ★ ☆ ☆
TITANIUM ALLOYS			
Pure titanium and alloys	Sandblasting	★ ★ ★ ★ ☆	★ ★ ★ ★ ★



## COATING THICKNESS

NOMINAL THICKNESS, OPTIONAL	TOLERANCE
3 ÷ 50 µm	± 10% (min ±2 µm)
Uniform thickness over entire external and internal surface	
Absence of point effect typical of galvanic coatings	



## AESTHETIC APPEARANCE

Bright stainless metal appearance based on the morphology of the machined piece
Matt finish option (sandblasted, shot peened or shotblasted)
In case of hardening treatment, the layer could become discoloured:
• 340°C, iridescent blue-red colour

## HARDNESS

The surface hardness of Niplate 500 varies according to the hardening heat treatment performed after layer deposition	
HARDNESS VALUE	HEAT TREATMENT
 550±50 HV	Dehydrogenation 160-180°C x 4 hrs
 1000±50 HV	Hardening 340°C x 4 hrs

## WEAR RESISTANCE

For applications where the part undergoes wear, the use is recommended of Niplate 600 instead of Niplate 500. Niplate 500 nevertheless has good wear resistance depending on the heat treatment performed.	
APPROXIMATE WEAR VALUE, TWI-CS10	HEAT TREATMENT
 20±2 mg / 1000 cycles	Dehydrogenation 160-180°C x 4 hrs
 12±2 mg / 1000 cycles	Hardening 340°C x 4 hrs
A LOW NUMBER INDICATES A BETTER PERFORMANCE – ASTM B733 X1 – TABER ABRASER WEAR TEST – ABRASIVE WHEELS CS 10 – LOAD 1 KG	

## FRICTION COEFFICIENT

DYNAMIC DRY FRICTION COEFFICIENT VALUE
 0.4 ÷ 0.6 depending on antagonist material

## CORROSION RESISTANCE

The corrosion protection of Niplate 500, assessed by means of salt mist test, depends on the base material, piece machining and finishing and the thickness of the applied coating

APPROXIMATE CORROSION RESISTANCE VALUES	BASE MATERIAL
 ≥1000 hours	Brass
 ≥240 hours	Carbon steel
 ≥240 hours	Aluminium 6082

NSS ACCORDING TO ISO 9227 – THICKNESS 20 µm – CORRODED SURFACE < 5%

## CHEMICAL RESISTANCE

Excellent chemical resistance and to oxidization in many aggressive salt environments.

Passes the concentrated nitric acid immersion test (RCA, Nitric acid test – Concentrated nitric acid 42Bé, 30 seconds, room temperature).



- ✓ Hydrocarbons (e.g. petrol, diesel fuel, mineral oil, toluene)
- ✓ Alcohols, ketones (e.g. ethanol, methanol, acetone)
- ✓ Neutral saline solutions (e.g. sodium chloride, magnesium chloride, brine)
- ✓ Diluted reducing acids (e.g. citric acid, oxalic acid)
- ✗ Oxidizing acids (e.g. nitric acid)
- ✗ Concentrated acids (e.g. sulphuric acid, hydrochloric acid)
- ✓ Diluted bases (e.g. diluted sodium hydroxide)
- ✗ Oxidizing bases (e.g. sodium hypochlorite)
- ✗ Concentrated bases (e.g. concentrated sodium hydroxide)

Approximate values of compatibility with the coating environment only, they do not indicate corrosion protection of the base material. The overall performance of the coated piece depends to a large extent also on the type and quality of the base material. The actual resistance to the environment must in any case be tested in the field.

## WELDABILITY

- ✓ Easily braze weldable using RMA, RA acid flow agents

## FERROMAGNETISM

PRESENCE OF FERROMAGNETISM	HEAT TREATMENT
 Non ferromagnetic	Dehydrogenation 160-180°C x 4 hrs
 Ferromagnetic	Hardening > 220°C

## MELTING POINT, SOLIDUS

870°C

## DENSITY

7,9 g/cm<sup>3</sup>

### MICRON SRL

ELECTROLESS NICKEL | PEO MAGNESIUM

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