

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.

Main properties of high-phosphorus electroless nickel

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	P
87÷90%	10÷13%
Ni-P alloy with high phosphorus content	
MDS REPORT	
IMDS ID: 359192271	
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 titanium alloys	Sandblasting	★★★★☆	★★★★★

COATING THICKNESS

NOMINAL THICKNESS, OPTIONAL

TOLERANCE

3÷50µm

±10% (min. ±2µm)

Uniform thickness over the entire external and internal surface

Absence of the point effect typical of galvanic coatings

AESTHETIC APPEARANCE

Bright stainless steel metal appearance with morphology similar to machined piece

Matt finish option (sandblasted, shot-peened or shotblasted)

In case of hardening treatment, layer discolouring could occur:

- 270-280°C, white colour and possible yellow halos
- 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±50HV

Dehydrogenation 160-180°C x 4 hrs



800±50HV

Hardening 270-280°C x 8 hrs



1000±50HV

Hardening 340°C x 4 hrs



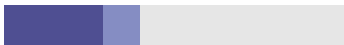
WEAR RESISTANCE

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

A LOW NUMBER INDICATES A BETTER PERFORMANCE – ASTM B733 X1 – TABER ABRASER WEAR TEST – ABRASIVE WHEELS CS 10 – LOAD 1 KG

	20±2 mg / 1000 cycles	Dehydrogenation 160-180°C x 4 hrs
	17±2 mg / 1000 cycles	Hardening 270-280°C x 8 hrs
	12±2 mg / 1000 cycles	Hardening 340°C x 4 hrs

FRICTION COEFFICIENT

DYNAMIC DRY FRICTION COEFFICIENT VALUE

	0.4 ÷ 0.6 depending on antagonist material
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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

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

	≥1000 hours	Brass
	≥240 hours	Carbon steel
	≥240 hours	Aluminium 6082










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).

CHEMICAL COMPATIBILITY

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.

-  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)




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 270–280°C x 8 hrs
	Ferromagnetic	Hardening 340°C x 4 hrs

MELTING POINT, SOLIDUS

870°C

DENSITY

7.9 g/cm³