MICRON COATINGS GROUP

NIPLATE® EXTREME ELECTROLESS NICKEL PLATING

Niplate eXtreme is an electroless nickel plating developed specifically to increase corrosion resistance, especially on aluminium alloys.

Thanks to a research project, the nickel alloy deposition process parameters have been optimized in order to improve the performance of coated aluminium components. This is the background to the Niplate eXtreme treatment, which makes it possible to protect aluminium parts subject to corrosion and frequent wetting.

The coating has very low porosity and it increases salt spray resistance, limiting subsurface oxidation phenomena.

The coating can be applied to all aluminium alloys, from machined billets such as the 7000 and 2000 families employed in the aeronautical industry and in the racing sector (F1 and MotoGP), and cast and die cast alloys with high silicon contents.

EXCELLENT CHEMICAL AND CORROSION RESISTANCE

Absence of porosity, excellent adhesion and high chemical resistance ensure Niplate eXtreme offers unparalleled corrosion resistance, especially on aluminium alloys. Makes it possible to reach 720 hours of neutral salt spray (NSS) without the onset of corrosion.

METAL COATING

Unlike anodizing, the coating is composed of a metal film similar to stainless steel in color. The coating retains its color and bright appearance through time, thanks to its high chemical resistance.

HIGH SURFACE HARDNESS

The coating offers high surface hardness assuring scratch and wear resistance while maintaining aesthetic appearance and corrosion resistance properties unchanged.

UNIFORM THICKNESS

Uniform and constant coating thickness over the entire surface, including holes; ideal for precision machined parts with tight tolerances and complex geometries.

TECHNICAL SPECIFICATIONS

COMPOSITION AND APPLICABLE STANDARDS

COMPOSITION	
Ni	P
87÷92%	8÷13%
Ni-P alloy, high phosphorus electroless nickel plating	

TECHNICAL STANDARDS
ISO 4527 I NiP

ROHS COMPLIANCE
RoHS compliant. No restricted substances present in amounts greater than the maximum tolerated concentrations.

REACH COMPLIANCE
REACH compliant. No SVHCs present in amounts higher than 0.1% by weight.

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COATABLE METALS

IRON ALLOYS		CHARACTERISTICS
Carbon steel	Adhesion	★★★★★
	Corrosion resistance	★★★★☆
Stainless steel	Pre-treatment	Sand blasting
	Adhesion	★★★★☆
	Corrosion resistance	★★★★★
Case hardened steel	Pre-treatment	Sand blasting
	Adhesion	★★★★☆
	Corrosion resistance	★★★☆☆

COPPER ALLOYS		CHARACTERISTICS
Brass, Bronze, Copper	Adhesion	★★★★★
	Corrosion resistance	★★★★★

ALUMINIUM ALLOYS		CHARACTERISTICS
Machining alloys	Adhesion	★★★★☆
	Corrosion resistance	★★★★★
Foundry alloys	Adhesion	★★★★☆
	Corrosion resistance	★★★★☆

TITANIUM ALLOYS		CHARACTERISTICS
Pure titanium and titanium alloys	Pre-treatment	Sand blasting
	Adhesion	★★★★☆
	Corrosion resistance	★★★★★

COATING THICKNESS AND AESTHETIC APPEARANCE

COATING THICKNESS
TYPICAL THICKNESS
15-20 µm
Uniform thickness over the entire external and internal surface
Absence of tip effect typical of galvanic coatings

AESTHETIC APPEARANCE
Bright stainless steel metallic appearance that reproduces the morphology of the machined part
Option of matt finish (sand blasted, shoot peened, or grit blasted)

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TRIBOLOGICAL PROPERTIES

HARDNESS

HARDNESS VALUE	HEAT TREATMENT
600±100HV	Hydrogen embrittlement relief at 160-180°C for 4h

WEAR RESISTANCE

For applications in which the part is subject to intense wear, the use of Niplate 600 is recommended in place of Niplate eXtreme. Niplate eXtreme anyway offers a good level of wear resistance.

GUIDELINE WEAR VALUE, TWI-CS10	HEAT TREATMENT
THE LOWER THE NUMBER, THE HIGHER THE PERFORMANCE - ASTM B733 X1 - TABER ABRASER WEAR TEST - CS 10 ABRASIVE WHEELS - 1 KG LOAD	
20±2 mg / 1000 cycles	Hydrogen embrittlement relief at 160-180°C for 4h

FRICTION COEFFICIENT

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

CHEMICAL PROPERTIES

CORROSION RESISTANCE

The Niplate eXtreme coating offers higher salt spray corrosion resistance than conventional electroless nickel plating treatments, especially on aluminium alloys.
The corrosion protection of Niplate eXtreme, assessed by means of the salt spray test, depends on the base material, machining and finish of the part, and on the applied film thickness.

GUIDELINE CORROSION RESISTANCE VALUES	SUBSTRATE MATERIAL
NSS TO ISO 9227 - THICKNESS 20 µm - CORRODED SURFACE < 5%	
≥1000 hours	Brass
≥240 hours	Carbon steel
≥500 hours	Aluminium 6082

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CHEMICAL RESISTANCE
Excellent chemical and oxidation resistance in highly aggressive saline environments. Passes the concentrated nitric acid immersion test (RCA nitric acid test: 42 degree Bé concentrated nitric acid, 30 seconds, ambient temperature).

CHEMICAL COMPATIBILITY	
Chemical compatibility values are referred **exclusively** to the coating and **do not** define the corrosion protection of the substrate material. The overall performance of the coated part is highly dependent also on the type and quality of the substrate material. The actual environmental resistance must anyway be tested in the field.	
✓	Hydrocarbons (e.g. petrol, diesel, mineral oil, toluene)
✓	Alcohol, ketones (e.g. ethanol, methanol, acetone)
✓	Neutral saline solutions (e.g. sodium chloride, magnesium chloride, seawater)
✓	Dilute reducing acids (e.g. citric acid, oxalic acid)
✕	Acid oxidizing agents (e.g. nitric acid)
✕	Concentrated acids (e.g. sulphuric acid, hydrochloric acid)
✓	Dilute bases (e.g. dilute sodium hydroxide)
✕	Base oxidizing agents (e.g. sodium hypochlorite)
✕	Concentrated bases (e.g. concentrated sodium hydroxide)

PHYSICAL PROPERTIES

WELDABILITY
Easily brazed using RMA, RA acid fluxes

FUSION POINT, SOLIDUS
870°C

DENSITY
8.0 g/cm^3

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