



PT. SINAR CEMARAMAS ABADI

- VERCOPPER (ACID / CYANIDE COPPER)
- VERNICKEL
- VERCHROME
- VERZINC ACID / CYANIDE ZINC
- CLEANER (ELEKTRO / SOAK)
- PHOSPHATING
- CHROMATING
- ELECTROLESS NICKEL

FOR HIGHTECT ELECTROPLATING :

- ELECTROLESS NICKEL PLATING FOR ALUMINIUM AND ZINC DIE CAST, MAGNESIUM
- GOLD PLATING
- PTFE FORELECTROLESS NICKEL
- HARDCHROM
- SAND CAST ALUMINIUM ALLOYS PLATING
- MAGOXID - COAT FOR PROTECTING MAGNESIUM SUBSTRATES

- KEPLA - COATING FOR ALUMINIUM AND TITANIUM ALLOYS
- ELECTROLESS NICKEL PLATING WITH INTEGRATED SILICON CARBIDE PARTICLES (SIC)
- GLISS - COAT

- A CLEAN SOLID FILM LUBRICATION FOR A MAINTENANCE FREE PERMANENT LUBRICATION OF ALL KIND OF FRICTION PAIRINGS
- SEPA - COAT (ANTI ADHESIVE COATING AND ACTIVATOR) FOR THE REMOVAL OF PART FROM MOULDS

NITEC CRYSTAL HR

SATIN PROCESS FOR BARREL AND RACK PLATING

1. DESCRIPTION

In contrast to bright nickel, the NITEC CRYSTAL HR electroplating process produces non reflective, satin, fine crystalline nickel deposits. Even on polished surfaces are these deposits almost non-reflective and the resistance to fingerprint marking and small scratches is excellent.

PROPERTIES

- Uniform mat deposits across the whole current density range
- Very active surface condition for subsequent coatings
- Excellent metal deposit thickness distribution

2. SOLUTION MAKE – UP

a) Bath Make Up

	Rack		Barrel	
	range	optimum	range	optimum
Nikel Sulphate (Ni SO ₄ x 6 H ₂ O)	410 – 460 g/l	435 g/l	430 – 500 g/l	465 g/l
Nickel chloride (Ni Cl ₂ x6H ₂ O)	20 – 40 g/l	30 g/l	20 – 40 g/l	30 g/l
Boric Acid (H ₃ BO ₃)	40 – 45 g/l	42 g/l	40 – 45 g/l	42 g/l
Nitec Crystal Carrier TW	15 – 22 m/l	20 m/l	20 – 25 m/l	22 m/l
Nitec Crystal Carrier TS	3 - 10 m/l	6 m/l	3 – 10 m/l	6 m/l
Nitec Crystal Additive T	0.3 - 0.8 m/l	dep. On finish	0.8 - 1.2 m/l	dep. On Finish
pH – Value	4.1 - 4.5	4.2	4.1 - 4.5	4.2

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b) Important

The satin nickel effect is dependent on daily addition of NITEC Crystal Additive T Any other addition are not recommended.

For conversion 4 ml/l of our NITEC Crystal special Additive T is recommended.

c) Bath values

	Rack		Barrel	
Nickel (Ni ²⁺)	100 – 110	g/l	105	g/l
Chloride (Cl)	7 – 13	g/l	10	g/l
Boric acid (H ₃ BO ₃)	40 – 45	g/l	42	g/l

d) Bath Make – up

A separate tank is filled with deionised water to 2/3 of the final volume. The water is then heated to at least 60o C after which the chemical are added and the tank is filled to final volume with deionised water. To remove contaminants 0.5 ml/l Hydrogen peroxide Is added and the solution is stirred for at least one hour. This is followed by addition of 5 g/l RIASORB activated carbon and mixing for another 30 minutes. After settling, preferably overnight, is the electrolyte transferred to the working tank by means of filtration. Finally, the correct undiluted volumes of NITEC Crystal Carrier TW and NITEC Crystal Carrier TS are added. The NITEC Crystal Additive T must be diluted 1: 20 with deionised water and mixed well prior to tank addition whilst slightly stirring. All addition should be made ½ -1 hour before commencing electroplating.

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e) Important Notice

No other organic chemicals (wetting Agents etc.) must be added to the electrolyte. The drag- in of other chemicals could result in bright plating and an increased requirement for Nitec Crystal Additive T. The pre- plating water rinse should also be deionised water. The pH is corrected by additions of 10 % Sulphuric acid or Nickel Carbonate.

3. OPERATING PARAMETERS

	Rack	Barrel
a) Temperature	(50 – 55 o C) 52oC	(45-50 o C) 48 o C
	The temperature should be maintained above 35 o C during idle times	
b) pH- value	4,2 (4,1 – 4,5)	4,2 (4,1 – 4,5)
c) Cathodic current density	3 – 7 A/dm ²	0,5 – 1,5 A/dm ²
d) Anodic current density	1 – 3 A/dm ²	1 – 3 A/dm ²
e) Tank voltage	4 – 10	> 10
f) Deposit rate	at 5A/dm ² ca. 1.0 µm/min	at 1 A/dm ² ca. 0.2 µm/min.
g) Rectifier	< 5 % Ripple	< 5 % Ripple
h) Deposit time	4 – 10 min	> 30 min
i) Agitation	Cathode movement 2-3 m/min	Barrel rotation <4U/min
j) Anodes	Minimum purity 99.7%Ni. We recommend polypropylene anode bags	
k) Tanks	plastic or lined steel	
l) Filtration	It is important not to use filtration during plating !Filtration can be Carried out through 5 um plate or candle filters for ca. 8 hours after Production.	

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5. FUNGSION OF ADDITIVIES

a) NITEC Crystal Additive T

The function of this additive is to ensure non – reflective deposits. Increasing the concentration will intensify this mat effect. Prior to adding the **NITEC CRYSTAL ADDITIVE T** has to be diluted 1 : 20 with deionised water. The mixture is then added carefully whilst stirring. The operational window lies between 10 – 16 hours, after which the electrolyte must be filtered. This removes the residue and we recommend activated carbon filtration for a duration of approximately 6 – 8 hours.

b) NITEC CRYSTAL CARRIER TS

The NITEC CRYSTAL CARRIER TS concentration can be determined by analysis and we recommend maintaining operational limits at all times.

A too low concentration causes “ porosity” during plating while overdosing results in poor “crystal mat” formation. Regular additions according to the data sheet must be made.

c) NITEC CRYSTAL CARRIER TW

The NITEC CRYSTAL CARRIER TW concentration can also be determined analytically and we recommend maintaining the minimum level at all times. While too low concentrations cause bright plating, slight overdosing is not detrimental. Regular additions must be made according to the data sheet.

The NITEC CRYSTAL CARRIER TW – and TS can be mixed for automatic dosing systems.

IMPORTANT !

The filter pump must be switched off prior to NITEC Crystal Additive T additions and during plating to prevent the NITEC Crystal Additive T removal from the electrolyte

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6. NICKEL CONCENTRATION

The Nickel concentration has only a limited effect on deposit appearance as long as the operational concentration is maintained above 100 g/l nickel. Lower values tend to reduce the “mat-effect” and must be adjusted by Nickel sulphate additions accordingly.

7. CHLORIDE CONCENTRATION

Too high concentration results in a slight brightening effect while lower values do not effect deposit quality.

8. BORIC ACID

The Boric acid concentration has, within operational limits, little influence on deposit quality. However, too low values tend to cause deposit “burning” or pitting.

9. ACTIVATED CARBON

The NITEC CRYSTAL ADDITIVE T is removed by filtration and activated carbon treatment in beneficial during this stage for the removal of organic breakdown products as well. For this we recommend our dust-free product RIASORB that has an active surface area of 1500 m² / g.

10. EQUIPMENT

The NITEC CRYSTAL HR process can be operated on a production basis without problems but relevant plant changes must first be considered. Our technical team is ready to advise you accordingly.

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11. A TROUBLE SHOOTING GUIDE IS AVAILABLE ON REQUEST

a) Technical Specifications

At 20 ° C	appearance	pH-value
NITEC Crystal Carrier TW	clear, liquid	5.0 – 10.0
NITEC Crystal Carrier TS	clear, liquid	10.0 – 12.0
NITEC Crystal Additive T	clear, liquid	4.0 – 8.0
NITEC Crystal Special Additive T	clear, liquid	5.0 – 9.0

b) Stocks Levels

To ensure problem-free operation we recommend keeping the following minimum stock per 1000 lt bath.

NITEC Crystal Carrier TW	25 kg
NITEC Crystal Carrier TS	25 kg
NITEC Crystal Additive T	25 kg

12. ENVIRONMENTAL CONSDERATIONS

All concentrates, rinse waters and waste solution must be treated and discharged according to local effluent control regulations.

13. PRODUCT SAFETY

Classifications (CH)	NITEC Crystal Carrier TW	BAG T Nr. 611500 Poison class free
	NITEC Crystal Carrier TS	BAG T Nr. 611500 Poison class free
	NITEC Crystal Additive T	BAG T Nr. 611500 Poison class free
	NITEC Crystal Special Additive T	BAG T Nr. 611500 Poison class free

Further information can be gleaned from the EG-safety pamphlets.

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14. GUARANTEE

The technical information and recommendations in the working instruction are based on practical testing and are reliable, but are given without warranty or guarantee. The use of our products might vary according to local conditions and materials to be processed. We reserve the right to change or amend the working instruction based on technological advances.

The sale of our product is subject to the sales condition of our company.

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