



TECHNICAL DATASHEET

NILUX 1005

Bright Nickel Process for Rack & Barrel Plating

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Process Information

The highly levelled, ductile and mirror bright decorative nickel NILUX 1005 is used mainly on zinc die cast, steel and brass items that require top brightness and excellent appearance uniformity along with whitish color of deposit. It displays all the properties demanded of a modern high-performance electrolyte: Nilux 1005 is a successful brightener also can be used in barrel plating.

- High efficiency,
- short treatment times,
- simple mode of operation,
- minimal sensitivity to disturbances.

Equipment

Tank	Sheet steel with hard rubber lining, PVC/Polyester-reinforced material									
Mechanical agitation	Necessary, preferably air, mechanical also possible									
	<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>stroke length</th> <th>double strokes/min</th> </tr> </thead> <tbody> <tr> <td>horizontal</td> <td>100 mm</td> <td>20 - 25</td> </tr> <tr> <td>vertical</td> <td>60 mm</td> <td>25 - 30</td> </tr> </tbody> </table>		stroke length	double strokes/min	horizontal	100 mm	20 - 25	vertical	60 mm	25 - 30
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Air agitation	<p>The required volume of air for this purpose amounts to approx. 12 - 20 m³/h/meter of the cathode rod.</p> <p>For air agitation, at least 2 plastic air supply tubes are required, which must be mounted approx. 30 - 80 mm, above the tank bottom, parallel to the cathode rod.</p> <p>Their mutual spacing must be 150 - 200 mm, depending on the rack projection. Air-tube inside diameter must be 20 - 40 mm. Two rows of staggered holes 3 mm in diameter must be provided at an angle of 45° to the tank bottom, located every 40 - 50 mm. Suitable materials: PVC or Polyethylene. Blowers are recommended which ensure generation of oil- and dust-free air. An oil separator is absolutely necessary if compressed air is used for agitation.</p>									
Exhaust	Required.									
Filtration	Continuous, 5 to 8 tank volumes per hour throughput, 5 to 10 micrometer mesh filter media.									
Filter aid	Filter aid, filter cellulose. The filter activated carbon can be employed for occasional removal of small amounts of organic contaminations. This will not remove the brighteners from the electrolyte only a small quantity of the wetting agent will be absorbed.									
Heating	Graphite, Titanium, PTFE, hard glass, porcelain									
Anodes	Bagged Nickel anode pieces in titanium baskets									



Make-Up

	optimum	range
NiSO ₄ *6H ₂ O	285,0 g/l	250,0 to 290,0 g/l
NiCl ₂ *6H ₂ O	65,0 g/l	50,0 to 70,0 g/l
H ₃ BO ₃	40,0 g/l	40,0 to 50,0 g/l
Carrier NILUX 1100	4,0 ml/l	2,0 to 6,0 ml/l
Leveller NILUX 1110	10,0 ml/l	8,0 to 12,0 ml/l
Brightener NILUX 1005	0,5 ml/l	0,5 to 1,0 ml/l
Wetting Agent NILUX 1400	2-5,0 ml/l	2,0 to 5,0 ml/l

Make up data for barrel plating:

	optimum	range
NiSO ₄ *6H ₂ O	200,0 g/l	200,0 to 280,0 g/l
NiCl ₂ *6H ₂ O	90,0 g/l	45,0 to 100,0 g/l
H ₃ BO ₃	40,0 g/l	40,0 to 50,0 g/l
NILUX 1100 carrier	4,0 ml/l	2,0 to 6,0 ml/l
NILUX 1110 leveller	5,0 ml/l	2,0 to 8,0 ml/l
NILUX 1005 brightener	0,2 ml/l	0,2 to 0,4 ml/l
NILUX 1400 A wetting agent	2,0 ml/l	1,0 to 3,0 ml/l

Make up procedure:

- Into a separate and clean tank, hot water is filled up to approximately 60 % tank volume.
- While stirring, add slowly and carefully the required quantity of Nickel Chloride into the water. (Attention !: Nickel Chloride must be fully dissolved!).
- While continue stirring, add slowly and carefully the required quantity of boric acid into the water. (Attention !: Boric Acid must be fully dissolved!).
- While further stirring, add slowly and in small quantities the required quantity of Nickel Sulphate into the water. (Attention !: Nickel Sulphate must be fully dissolved!).
- Add 3 g/l activated carbon powder into the solution and stir for at least 30 minutes, then stop all agitation and allow carbon to settle down.
- Filter the solution through a 5 micrometer mesh filter media into the working tank. Make sure no active carbon particles are in the working solution.
- Top working tank with water up to operation level and switch on air agitation
- Measure and adjust the pH with diluted (1:10)sulphuric acid to operation range.
- Add the necessary quantity of additives.
- Switch on circulation filter pump.
- Adjust operation temperature if necessary to operation range
- Solution is ready for start up.

Working Parameters

Agitation	Necessary, Preferably air, mechanical also possible
Filtration	Continuous, 5 to 8 tank volumes per hour throughput, 5 to 10 micrometer mesh filter media.
Cathodic current density	Up to 8 A/dm ²
Temperature	55°C to 65°C
Anodes	Bagged Nickel anode pieces in titanium baskets



Plating speed	1 micron per minute at 5 A/dm ²
Tank ventilation	Necessary
pH value	Electrometrically 4.4 (4.0 - 4.6) pH-paper Lyphan L 663 4.6 (4.2 - 4.8) The pH-value is slowly increasing while working and should be checked once or twice daily. The adjustment is carried out by addition of sulphuric acid, chemically pure.
Bath density	d = 1.19 g/cm ³ at 20 °C
Voltage	4 -10 V

Maintenance

Under standard production conditions dosing of the Brightener NILUX 1005 to the electrolyte is done according to Ampere hours. In case Ampere hours are not known, additions of Brightener should not exceed 0,1 ml/l at once. It is recommended to make corrective additions in small doses. Regular addition of Carriers is not needed unless lack becomes visible by hullcell tests. Dosing of Wetting Agent NILUX 1400 is optional.

Estimated Consumption per 10 KAh:

NILUX 1005 1.5 to 2.5 liter

Attention: Consumption of additives for acid copper plated parts can be up to 50% lower!!

Hullcell tests (2A, 7min or 10 min, 60°C, without agitation) are carried out to control performance.

Trouble-shooting:

- Poor LCD performance is caused by lack of Carrier NILUX 1100 or by excess of or by third party nickel additives and residues. Add 2ml/l Carrier NILUX 1100 to correct and stop dosing of Brightener for a while.
- Pit formation is caused by lack of Wetting agent NILUX 1400 or by drag in of oil and other impurity. Add first up to 1 ml/l Wetting agent NILUX 1400 .
- Lack of ductility or tendency to burn indicates lack of Leveller NILUX 1110.
- Permanent loss of compressive stress is caused by foreign additives and indicate the need for carbon treatment.

Effluent treatment:

All concentrates and rinsing waters have to be treated according to local regulations.

Health and Safety

Material Safety Data Sheets are available for all GALVANO MONDO products, they are normally issued with relevant quotations and Technical Data Sheets. They explain hazards associated with the product following classification by European Statutory Requirements. Normally more than one product will be used in a process. Risk evaluation of the process is the users responsibility because the user controls men, materials, methods and machines. The user must consider all of the substances present in the solution, whether they present a risk to people and the environment, whether abatement measures are needed.