FINIDIP SILVER ZN - NI

Transparent Passivation with Trivalent Chromium

for Electrolytic Zinc – Nickel (12 ÷ 16%)

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1 – PROCESS PRESENTATION

FINIDIP SILVER ZN-NI is a bright-grey transparent passivation process suitable for zinc – nickel alloy 12 ÷ 15% deposits.

➢ **completely hexavalent chromium (Cr^{VI}) free**

To increase the corrosion resistance, it is possible to put on passivation films a FINIGARD top-coat or sealer.

➢ The FINIDIP SILVER ZN-NI passivant has to be put on zinc – nickel deposit caused by PERFORMA 280 range processes.

➢ This process contains trivalent chromium.

➢ Both rack and barrel application.

2 – SOLUTION MAKE-UP

- Fill in the bath tank 2/3 with water;
- Add the FINIDIP SILVER ZN-NI quantity;
- Top up to the final volume with water;
- Control the pH and ad just it using sodium hydroxide 30% and/or sulphuric acid 50% at the optimum of 3.0.

Per 1.000 litres of volume	
FINIDIP SILVER ZN-NI	125 l. (144 Kg.)
Water	At final volume

3 – WORKING CONDITIONS

Parameter	Optimum	Range
FINIDIP SILVER ZN-NI	125 ml/l	100 ÷ 150 ml/l
pH	3.0	2.8 ÷ 3.2
Temperature	40 °C	30 ÷ 50 °C
Dipping time	30 sec.	20 ÷ 50 sec.
Agitating	Air 2-3 m^3/h	Air 2-3 m^3/h
Zinc – nickel minimum thickness	6 µm.	6 µm.

3.1 Concentration

We advise to work following the indicated range.
A higher concentration may not balance a lower temperature (ex. 30°C) that strongly slows down the passivating effect.

3.2 Temperature

The passivation process slows down with temperatures lower than 40°C and it also does not assure an excellent protection.

3.3 pH

During make-up step it is necessary to add nitric acid to have a 2.8 pH.
To adjust it use:

- Sulphuric acid 50% to lower it;
- Sodium hydroxide 30% to raise it.

The nitric acid consumption addition depends on drag-out.

3.4 Dipping time

It also includes the movement duration from passivation bath to the first flowing rinse. All this happens because the solution passivates until rinse step.
If the passivation is new it will be possible to decrease the dipping time up to 20 ÷ 30 seconds. Then, it will be necessary to gradually increase it.

3.5 Agitating

The blown-in air one must be uniform and mild.
As an alternative, use the mechanical agitating with a centrifuge pump.
If parts or the solution are still, the dipping time will be necessarily longer.

4 – SOLUTION MAINTENACE AND CONTROL

4.1 Frequently control the pH at least every 4 working hours.
The pH optimal value changes according to treatment time, concentration and temperature.

Adjustments must be done with:

- Sulphuric acid 50% to lower it;
- A sodium hydroxide solution 30% to raise it.

4.2 Consumption per **100 m^2** of treated surface:

0.08 ÷ 0.13 l. of FINIDIP SILVER ZN-NI (d= 1.15 g/cc)

These values derived from the chrome quantity plated on the film without considering the passivation drag-out.
The drag-out influence is important for the products consumption and for the industrial costs calculation.
During working step, with medium drag-out of:

Rack systems	0.20 l/m^2
Barrel systems	0.25 l/m^2

It has been calculated a rela total consumption per **100 m^2** of treated surface of:

1.6 ÷ 3.0 l. of FINIDIP SILVER ZN-NI (d= 1.15 g/cc)

Consumption increases in proportion to drag-out.
It is possible to analytically control passivation concentration through the CrIII concentration analysis.
The analytical methods are available, if required, at our Customer Service Labs or at our Technical Department.

4.3 Passivation film colour shade and aspect depend on working parameters (concentration, pH, dipping time, temperature, zinc and iron pollution level and drying temperature) combination.

4.4 The passivant solution allows up to:

Zinc 10 ÷ 15 g/l;
Iron 100 ÷ 150 mg/l (ppm).

Iron causes a yellow-spot appearance especially on drying and dripping points on holes.

5 – PROCESS SEQUENCE

After an excellent zinc – nickel treatment:

➜ only passivation
- Rinse in running water
- Rinse in running water
- Passivation FINIDIP SILVER ZN-NI
- Rinse in running water
- Rinse in running water
- Hot air drying

➜ With top - coat
After the following-passivation rinse

- Cold drying for 2÷5 minutes at 250 turns/min. (∅ 60 cm.)
- FINIGARD 105 (85% at 25°C for 30 seconds)

or FINIGARD 401/450/460 (35% at 25°C for 30 seconds)
- Drying for 10 minutes at 80°C at 250 turns/min. (∅ 60 cm.)

6 - EQUIPMENT

The FINIDIP SILVER ZN-NI passivation is composed by acidic substances and fluorides. For this reason we advise to use resistant materials:
- PVC, PPH, ebonized or plastified steel.

We also advise to use a thermostat and blowers for the air injection.

7 – HEALTH AND SAFETY

The FINIDIP SILVER ZN-NI passivation is an acidic product with fluorides.
Take proper precautions as gloves, protective glasses and rubber boots.
Carefully read and follow the instructions for the handling of the products that are on the package labels and safety datasheets.
Properly inform all the working staff.

8 – WASTE WATERS

The FINIDIP SILVER ZN-NI solution does NOT contains chromates, but fluorides and heavy metals such as CrIII, cobalt, iron and zinc.

9 – PRODUCT SHELF-LIFE

We recommend checking the use-by date on the label and on the Certificate of Conformity.
We recommend to always storing the products in closed packages, away from heat sources, protected from rain and light.
For further information, please consult our health & safety sheet.