FINIGARD 460

ORGANO-MINERAL FINISH FOR PASSIVATED ZINC AND ZINC ALLOY WITH HIGH CORROSION RESISTANCE

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1 de 6	04/2003	N.POMMIER		JJ.DUPRAT	1	

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1 - INTRODUCTION

FINIGARD 460 has been developed to reinforce the anti-corrosion properties of Cr^{III} passivations on zinc and zinc alloys for the automotive industry.
FINIGARD 460 is designed to protect passivated zinc and zinc alloys against corrosion in a variety of environments, including the hostile conditions found in engine compartments and on the exterior of motor vehicles.

It has been shown that typical inert protective films over passivated zinc can never be made completely impermeable in industrial production. Indeed, 2 or 3 microns of resin, varnish, polymerising or film-forming products will never remain completely water-proof, especially after thermal shock or mechanical strain.

The FINIGARD ORGANO-MINERAL finish consists of :

POLYSILICATES of extremely small size (diameter less than one-hundredth of a micron) which reinforce and maintain the film's protective properties
ORGANIC POLYMERS which assure coating cohesion and moreover produce a low co-efficient of friction
INHIBITORS against zinc corrosion, which are fixed by the polysilicates

When the zinc is attacked by chlorides or acids, the inhibitors are released and the aggressive agents are blocked by the polysilicates, neutralising their action.

This is the principle of active protection.

2 – PROCESS PERFORMANCES

- Appliable on Cr^{III} passivations. Leads to films completely free of Cr^{VI}
- High corrosion protection and stability versus temperature (over 120°C during several hours)
- High adherence on zinc electroplated parts
- High ductility
- Improves self-healing properties of Cr^{III} passivations

- FINIGARD 460 can be applied on top of clear passivations but also on top of black Cr^{III} passivations on zinc and zinc alloys without any colour leaching.
- Corrosion resistance: The following results were performed on a 8 to 10 µm Zn or Zinc alloy layer passivated with the various processes hereunder mentioned.
  The parts were tested according to DIN 50021 or NFX 41002 after tempering 24 hours at 120°C.

Substrate	Passivation system	Corrosion results
Zinc	LANTHANE 315	Barrel > 144 H WR Rack > 240 H WR Both > 360 H RR
Zinc / Iron	LANTHANE 315	Barrel > 192 H WR Rack > 360 H WR Barrel > 480 H RR Rack > 600 H RR
	FINIDIP 726	Barrel > 144H WR Rack > 240H WR Both > 480H RR
Zinc / Nickel	FINIDIP 128	Barrel > 240H WR Rack > 480H WR Both > 720H RR

3 - OPERATION

3.1 EQUIPMENT

Tanks, pumps, filters, etc., for use with FINIGARD 460 working solutions should be resistant to alkaline, oxidising solutions. Plastic materials such as polypropylene or PVC are preferred. The bath should be thermostatically controlled, and continuous agitation by means of a suitable circulation pump or stirrer is essential. Filtration through a 80 - 150 µm filter is necessary to optimise corrosion resistance.

3.2 MAKE-UP

It is imperative that the working solution is made up in the order given.

To a perfectly clean tank, first add FINIGARD 460 solution at the rate of 300 mL/L to 500 mL/L. Make up to the operating volume by adding mains water at 20°C with continuous agitation. Start filtration.

Application is divided in two phases :

1- High corrosion resistant Cr^{III} passivation (selected among the under mentioned processes)

Clear passivations :	***FINIDIP 140 (Zn)***
	LANTHANE 311, 315 (Zn)
	FINIDIP 128 (Zn/Ni)
Black passivations :	***FINIDIP 726 (Zn/Fe)***
	FINIDIP 728 (Zn/Ni)

2- Organo-mineral Finition: ***FINIGARD 460***

3.3 STRIPPABILITY

FINIGARD 460 gives a hard film on parts and also on plastic jigs once dried.
It is absolutely necessary to remove and solubilise FINIGARD 460 from jigs and eventual replated parts in the cleaners (alkaline phase).
For this, we recommend using cleaners with very high cleaning power and to incorporate FOM stripper (5 to 20 mL/L) in the soak cleaner.

4 - OPERATING PARAMETERS

High corrosion resistant Cr^{III} passivations
Use operating conditions as specified in the Operating Instructions sheet for the particular passivation applied.

FINIGARD 460 ORGANO-MINERAL FINISH

4.1 pH :

- The pH of the working suspension must be kept at 9.0 $\pm$0.5
- The suspension pH* must never be allowed to drop below 8.5

*to correct the pH, use make-up solution

4.2 Temperature :

- 20°C (up to 30°C)
- Variations in temperature affect the fluid characteristics of the suspension, ensure the temperature is correct. Temperatures under 20°C can lead to a severe decrease in the corrosion resistance properties of the films.

4.3 Time :

20 - 60 seconds

4.4 Agitation

Maintaining continuous agitation is *essential* to ensure system stability

4.5 Maintenance

- It is important to maintain the density of the bath (make-up: 50%) at a minimum of 1027 (at 20°C) and at 1019 (make-up : 35%) by regular additions of FINIGARD 460
- Consumption by m ² treated depends of the dragged out solution, we estimate generally between 0.1 and 0.3 liters the volume of solution consumed by m ².

4.6 Filtration

It is imperative to filter the bath using bags of porosity 80 - 150 µm

4.7 FINIGARD retention

In order to minimize the amount of product in the retention areas, it is advisable to incorporate
5 to 20 mL/L of FINIGARD SURFACT in the FINIGARD 460 bath.

NB: FINIGARD 460 must be protected from frost

5 - PROCESS SEQUENCE - RACK

Process sequence following Zn or Zn alloy deposition:

1. Activation rinse: 0.5 % v / v nitric activation (for Zn and Zn/Fe) or 0.1 % v/v hydrochloric activation (for Zn/Ni)
2. Cold water rinse x 2

3. Passivation : Cr^{III} based
4. Cold water rinse x 2
5. Drain with air blower to eliminate most of the water on the work to prevent excess carry-over of water into the FINIGARD 460
6. Organo-mineral finition: FINIGARD 460 : 20 - 60 seconds
7. Drain : 1 - 5 minutes, use air blower to remove excess product and droplets
8. Dry : 10 - 15 minutes in warm air (approx. 80°C on parts)

6 - HANDLING PRECAUTIONS

Pay strict attention to health & safety information given on product labels and health & safety data sheets.

7 - EFFLUENT TREATMENT

FINIGARD 460 working solution can contain hexavalent chromium (when applied on chromates). Do not discharge without treatment. Conform to all national and local regulations.

8 - SHELF LIFE

1 year from date of manufacture.