

riag Oberflächentechnik AG · Postfach 169 · CH-9545 Wängi TG

18.01.2024

riag NiZn 170

Black nickel process

riag NiZn 170 is an electroplating process for the deposition of deep black layers. It is a fast process with uniform looking layers and low thickness. For glossy layers polished surfaces are needed, otherwise the use of non reflecting surfaces (sandblasted, pickled or **Nickel-Satin-Elektrolyt**) is recommended. The layers are well qualified for indoor applications, when used for outdoor applications an additional protection is required.

Properties

- Deep black layers
- Uniform appearance
- Glossy or dull depending on the base material
- Free of boric acid

Make up

	range	optimum
riag NiZn 170 Salt 1		106.6 g/L
riag NiZn 170 Salt 2		35.0 g/L
riag NiZn 170 Salt 3		19.0 g/L
riag Ni 138 Tenside M *	0 – 3 mL/L	*2 mL/L
pH-value	5.5 - 6.0	5.7

* depending on customer-specific process requirements

Make up

The tank is filled with approx. 50 - 70 % DI water. The **riag NiZn 170 Salts** are added and dissolved while stirring continuously. After the pH value has been checked and adjusted if necessary, the electrolyte is filtered into the electrolyte tank. It is topped up with DI water to the calculated final volume. Normally, **riag Ni 138 Tenside M** is then added.

Operating values

	range	optimum
Nickel (Ni ²⁺)	20 – 23 g/L	21 g/L
Zink (Zn ²⁺)	7 – 9 g/L	8 g/L

Operating Parameters

Temperature:	43 °C (40 -	- 45 °C)	
pH-value:	5.7 (5.5 –	6.0)	
Cathodic current density:	0.4 – 0.8 A/dm ² (0.5 A/dm ²)		
Anodes:	Minimum purity 99.7 % Ni. We recommend polypropylene anode bags to prevent the contamination of the electrolyte with sludge from anodes. The anode basket should be made out of titanium. During interruptions it is recommended to remove the anodes.		
Agitation:	Recommended, filter pump and/ or cathode movement Barrel rotation: $6 - 12$ R/min. Cathode movement: $1 - 2$ m/min.		
Tanks:	Plastic or lined steel		
Filtration:	It is important to use continuous filtration		
Heating:	Immersion heaters, but thermostatic control is essential		
Cooling:	not required		
Fume extraction:	Recommended		
pH-value adjustment:	To lower the pH chem. pure sulphuric acid (10 %) is added. To raise the pH ammonia must be used.		
Maintenance:	Nickel and zinc should be analysed with ICP or AAS and corrected regularly by adding:		
	5.1 g/L	riag NiZn 170 Salt 1 To increase the content of nickel for 1 g/L	
	4.4 g/L	riag NiZn 170 Salt 2 To increase the content of zinc for 1 g/L	
	2 – 3 g/L	riag NiZn 170 Salt 3 If the operating values are correct, but the colour of the deposit is not black enough	
Post-treatment:	Under certain circumstances, immersion in the post-dip solution leads to particularly good results such as less iridescent or deeper black layers. Immersion time approx. 20 seconds at room temperature.		
Post-dipping solution:	5 - 10 mL/L riag Clean 628 Additive		
	2 - 3 g/L po	otassium cyanide	

Topcoats

Ask for technical advice.

Environmental considerations and product safety

All concentrates, rinse waters and waste solution must be treated and discharged in accordance with local effluent control regulations. Information can be gleaned from the material safety data sheets. Chemicals shall not be stored below 10 °C.

Liability

This instruction manual was compiled with reference to the state of the art and all current standards, and is based on the long-term knowledge and experience of riag. However, riag cannot monitor compliance with this instruction manual and the methods described herein at the customer/end-user's premises. Work carried out with riag products must be adapted accordingly to meet local conditions. In particular, riag cannot accept liability for damage, loss or cost incurred due to a failure to adhere to this instruction manual, improper application of the methods, unauthorised technical modifications, insufficient maintenance or the absence of maintenance in respect of the requisite technical hardware or equipment, or in the event of use by unqualified personnel. riag is not liable for damage or loss caused by riag or its employees except where intention or gross negligence can be proved. riag furthermore reserves the right to make changes in relation to products, methods and the instruction manual without prior notice.

Our goods and services are subject to the General Terms and Conditions for Delivery of the Association of Surface Technology Suppliers (VLO), which can be viewed at <u>www.riag.ch</u> (link "terms and conditions", document "General Terms and Conditions for Delivery", version 3/2018), which we gladly send you on request.

This transaction is governed by material Swiss law (Law of Obligations), excluding private international law (conflict of laws) and intergovernmental treaties, specifically the CISG.

riag Oberflächentechnik AG Murgstrasse 19a CH-9545 Wängi T +41 (0)52 369 70 70 F +41 (0)52 369 70 79 riag.ch info@riag.ch