

riag PZn 940

Acidic phosphating agent generating zinc phosphate coatings

The **riag PZn 940** is a phosphating process which produces adherent uniform coatings of zinc phosphate on various materials.

Properties

- Easy to operate, broad working area (immersion or spray process)
- Suitable for steel, iron, zinc and aluminum
- Excellent adhesion promoter for colours
- Excellent absorption of anticorrosion agents
- Produces uniform micro crystalline coatings
- Coating weight minimum 15 mg/dm² to 30 mg/dm²

Make up

	Spray Process	Immersion Process
riag PZn 940 Additive	15 – 20 mL/L	30 – 40 mL/L
riag PZn 940 Accelerator	0.5 – 1.5 pts	depends on application
Total acid (TA)	15 – 20 pts	15 – 20 pts
Free acid (FA)	1.2 – 1.5 pts	2 – 3 pts
Ratio	10 – 15	5 – 7
Temperature	50 – 75 °C	55 – 75 °C
Dip time	1 min.	3 – 5 min.

Fill tank with water up to $\frac{3}{4}$ of the final volume. Add the required amount of **riag PZn 940 Additive** and fill up with water to the final volume. Heat the agent up to a working temperature of 50 °C. The ratio of total acid to free acid is being determined by analysis and adjusted to the optimum. If required, add **riag PZn 940 Accelerator**.

Operating parameters

Temperature	60 °C (50 – 75 °C)
Make up	Spray process: 15 – 20 mL/L Immersion process: 30 – 40 mL/L The phosphating process is monitored by analysis of total acid, free acid and their ratio. Higher concentrations result in heavier coatings.
Total acid (TA)	17 points (15 – 20 points) To increase by 1 point add 1.25 mL/L riag PZn 940 Additive
Free acid (FA)	Spray process: 1.2 – 1.5 points Immersion process: 2 – 3 points To increase by 0.25 points add 1.25 mL/L riag PZn 940 Additive To reduce by 0.25 points add 75 mg/L sodium hydroxide Heavier coatings result from a higher free acid value.
Ratio	The ratio is determined by the amount of total acid compared to free acid Spray process: 10 – 15 Immersion process: 5 – 7
Zinc content	Usually 8 – 15 g/L
riag PZn 940 Accelerator	riag PZn 940 Accelerator is used as an accelerator as well as to precipitate iron. The content of iron should always be 0. To prevent an increase in iron small amounts of riag PZn 940 Accelerator are added periodically. No additions are necessary if coating aluminum or zinc. Iron test strips are used to monitor. An overdosage causes powdery zinc phosphate coatings.
pH-value	The pH-value is not important for the proper operation of the electrolyte.
Agitation	Not essential but beneficial (involves continuous sludge removal)
Parts movement	Barrel: 6 – 12 rpm Rack: 1 – 2 rpm
Tank	Stainless steel or lined steel tanks. The bottom of the tank should either have a slope, a sludge channel or a disc valve.
Heating	Stainless steel heaters or PTFE lined. Thermostatic temperature control is necessary.
Cooling	Not necessary
Exhaustion	As required by law

Procedure

1. Cleaning and degreasing
2. Rinsing
3. Activation in **riag PZn 941**
4. Phosphating in **riag PZn 940**
5. Rinsing
6. Neutralising
7. Anti-corrosive oil and / or drying

Desludging

Phosphating processes produce sludge which has to be removed regularly. After desludging or a partial electrolyte loss water has to be added. The electrolyte has to be analysed and replenished accordingly.

Corrosion protection

Ask for our non-committal advice.

Waste water treatment / Environmental protection

All concentrates, rinse waters and waste solution must be treated and discharged in accordance with local effluent control regulations. The product contains fluorides and acids; please consider your own safety. Information can be gleaned from the material safety data sheets.

Safety instructions

For further information please consult the material safety data sheets. Chemicals must 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 www.riag.ch (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.

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Analysis (Analytical methods)

Sample preparation:

The sample must be taken from a well-mixed location and allowed to cool down to 25 °C.

Free acid in phosphating processes (FA)

Reagents: Sodium hydroxide solution 0.1 mol/L
Dimethyl yellow (1 % in ethanol)

Procedure: 10 mL phosphate solution are transferred via pipette into a
250 mL beaker, add
200 mL deion. water, add
5 drops dimethyl yellow solution

Titrate with sodium hydroxide solution from red to yellow.
The colour change is rather dragging.

Calculation: Use of NaOH in mL = free acid (FA points)

Total acid in phosphating processes (TA)

Reagents: Sodium hydroxide solution 0.1 mol/L
Phenolphthalein (1 % in ethanol)

Procedure: 5 mL phosphate solution are transferred via pipette into a
250 mL beaker, add
150 mL deion. water, add
5 drops phenolphthalein solution

Titrate with sodium hydroxide solution from colourless to pink.

Calculation: Use of NaOH in mL x 2 = total acid (TA points)

Iron (II) in phosphating processes

Reagents: Potassium permanganate 0.02 mol/L
Sulfuric acid (1:1)

Procedure: 10 mL phosphate solution are transferred via pipette into a
250 mL beaker, add
150 mL deion. water, add
5 mL sulfuric acid

Titrate with potassium permanganate from colourless to purple. Purple colour has to stay for 15 seconds.

Calculation: Use of potassium permanganate in mL \times 0.558 = g/L Iron (II)