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riag PZn 950

Acidic phosphating agent generating zinc phosphate coatings in immersion processes

The **riag PZn 950** is a phosphating process which produces adherent uniform coatings of zinc phosphate on iron and steel.

Properties

- Easy to operate, broad working area
- Excellent corrosion protection
- Excellent absorption of anticorrosion agents
- Produces uniform micro crystalline or coarse crystalline coatings
- Coating weight up to 60 g/m² possible

Make up

	Range	Optimum
riag PZn 950 Additive	60 – 90 mL/L	70 mL/L
Total acid (TA)	54 – 90 pts	65 pts
Free acid (FA)	8 – 22 pts	13 pts
Ratio	1:3 – 1:8	1:5
Temperature	60 – 93 °C	70 °C

Fill tank with water up to $\frac{3}{4}$ of the final volume. Add the required amount of **riag PZn 950 Additive** and fill up with water to the final volume. Heat the agent up to a working temperature of 60 °C. In case the deposit weight of the parts has to meet a certain requirement increase the iron content with steel wool to the minimum value (ca. 60 g/100 L).

Operating parameters

Temperature	70 °C (60 – 93 °C)
Make up	Usually 70 mL/L riag PZn 950 Additive If thin layers or steels with a lower carbon content (construction steel) are phosphated the concentration can be reduced to 60 mL/L. High-strength low-alloy steels tend to be phosphated at higher concentrations up to 100 mL/L .
Total acid (TA)	65 points (54 – 90 points)
Free acid (FA)	13 points (8 – 22 points)
Ratio	1 : 5 (1 : 3 – 1 : 8)
Zinc content	Usually 8 – 15 g/L
Iron content	The increase depends on the throughput and shouldn't exceed a content of 10 – 15 g/L Fe. This can be controlled by adding riag PZn 940 Accelerator . If a high coat thickness has to be achieved the minimum content of iron shouldn't drop below 0.3 g/L.
pH - Value	1.3 – 2.4 Phosphating processes are mostly monitored by total acid, free acid and / or the ratio.
Agitation	Not essential but beneficial (involves continues sludge removal)
Parts movement	Barrel: 6 – 12 rpm Rack: 1 – 2 m/min.
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

Replenishment

To increase the total acid (TA) by 1 point add 0.95 mL/L **riag PZn 950 Additive**. Ideally replenishment is done with a dosing pump.

Procedure

1. Cleaning and degreasing
2. Rinsing
3. Pickling
4. Rinsing
5. Activation in **riag PZn 941**
6. Phosphating in **riag PZn 950**
7. Rinsing
8. Neutralising
9. 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.

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.

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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

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

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 x 0.558 = g/L Iron (II)