

riag AIX 652

Zincate process for pre-treatment of aluminium and aluminium alloys

riag AIX 652 is a highly concentrated liquid product for the make up of an alkaline, cyanide-free aluminium adhesion pickle (zincate process).

By a simple electroless immersion process, a metal layer is deposited on aluminium and its alloys, which is an excellent base surface for the subsequent electroless finishing or electroplating. The main reason is due to an enormous stability against acidic mediums.

The characteristics become significantly more important in memory disc applications, since they permit maximum adhesion of a thin, pore-free electroless nickel coating to a highly finished aluminium surface, with the least amount of etching, thus minimizing the thickness of the post-plate finish.

Suitable base materials of aluminium alloys with the following maximum allowable impurities:

- 10 % copper
- 9 % magnesium
- 1 % manganese
- 2 % zinc
- 15 % silicium
- 10 % tin

Advantages

- Liquid concentrate for easy make up and replenishment
- Can be used on a wide variety of aluminium alloys
- Long bath life reduces operating costs

Make up

	Range	Optimum
riag AIX 652 Additive	150 – 250 mL/L	200 mL/L
Deionised water	850 – 750 mL/L	800 mL/L

Make up

- 1) Fill the tank 2/3 full with cold deionised water
- 2) Add the required quantity of **riag AIX 652 Additive** slowly while stirring (avoid splashing)
- 3) Fill tank to operating level with deionised water and mix
- 4) Adjust temperature, if required, to operating range of 15 – 25 °C

Operating values

Operating temperature

15 – 25 °C

Immersion time

15 – 120 sec

The optimal immersion time depends upon the alloy and has to be determined by test prior to operation.

Equipment

Tank made of stainless steel (Mat. No.: 14401 or 14571) or plastic can be used. If stainless steel tanks are applied take care, that the aluminium parts do not get contact with the interior surface of the tank. Parts which dropped into the tank have to be removed immediately, because this could cause a deposition of copper on the wall of the tank.

Operation data

riag AIX 652 Additive is highly alkaline and contains sodium hydroxide. Before making up or replenishing the working solution, refer to the safety and handling section on page 3 to be certain you are aware of the protective gear you must wear, the correct method of adding **riag AIX 652 Additive** to the bath, and the first-aid procedures to follow in the event of accidental exposures to **riag AIX 652 Additive** liquid concentrates or solutions.

Pre-treatment

The aluminium surface must be cleaned thoroughly before the **riag AIX 652** treatment can take place. In this way, a uniform attack on the parts can be guaranteed.

Maintenance

Determine **riag AIX 652 Additive** concentration by titration analysis as described in the Analytical Control Section.

Maintain working solution at proper concentration with the required additions of **riag AIX 652 Additive** concentrate.

While **riag AIX 652 Additive** operates over a wide concentration range, the best practice is to maintain its concentration in the bath to within 15 – 25 %.

Safety and Handling

riag AIX 652 Additive is highly alkaline and contains sodium hydroxide. Store in a tightly closed container. Add **riag AIX 652 Additive** liquid concentrate to working solution carefully to avoid splashing. **riag AIX 652 Additive** concentrate and solutions can cause severe damage on contact with eyes and skin, and they may be fatal if swallowed.

Wear rubber gloves, chemical safety goggles or face shield and protective clothing while handling **riag AIX 652 Additive** concentrate or solutions. Wash thoroughly after handling.

In case of contact, immediately flush skin or eyes with large amounts of water for at least fifteen minutes. In case of eye contact, call a physician immediately.

Required pretreatment

- | | | | |
|--|-------------------|----------------------|---------------|
| 1. Soak Cleaner | 40 – 60 °C | | 1 – 10 min |
| 2. Double rinse | | | |
| 3. Alkaline etch | room temp. | NaOH 5 – 10 % | 15 – 120 sec. |
| 4. Double rinse | | | |
| 5. Etching | room temp. | HNO ₃ /HF | 15 – 60 sec. |
| 6. Double rinse | | | |
| 7. Activate in riag AIX 652 | 15 – 25 °C | | 30 – 60 sec. |
| 8. Double rinse | | | |
| 9. Etching | room temp. | HNO ₃ /HF | 15 – 60 sec. |
| 10. Double rinse | | | |
| 11. Activate in riag AIX 652 | 15 – 25 °C | | 20 – 45 sec. |
| 12. Rinse | | | |
| 13. Rinse | | | |
| 14. Fresh water rinse | | | |
| 15. riag PN 102 process | room temp. – 40°C | | 3 – 10 min |
| (to minimise contamination of following processes) | | | |
| 16. Rinse | | | |
| 17. Fresh water rinse | | | |
| 18. DURNI-COAT® - process or another following process (we recommend any riag Ni – | | | |
| process or an alkaline or cyanide riag Cu process) | | | |

After the steps 7 or 11 the goods should be covered with a greyish, uniform layer. If the surface is spotted the hole pre-treatment process has to be checked.

Depending on the alloy of aluminium and quality of material surface other pre-treatment steps or times may be necessary.

We shall elaborate the suitable sequence of operation for your application.

If the **riag PN 102** process is not used, process steps 15, 16 and 17 are omitted.

Compliance with the working temperature is essential for the formation of a well adhering zincate layer. Above 25 °C, the base material can be attacked.

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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Analytical control

Reagents: Na₂EDTA 0.1 mol/L
Triethanolamine, 50 % by vol.
Eriochrom Black T indicator mix (1 g of Eriochrome Black T indicator mixed with 100 g C.P. sodium chloride)
Buffer solution (Dissolve 55 g/L ammonium chloride and 350 mL/L Ammonium hydroxide and dilute to one litre with deionised water)

Procedure:

1. Pipette 5 mL sample of **riag AIX 652** working solution into 250 mL Erlenmeyer flask
2. Add 40 mL of 50 % triethanolamine
3. Add 25 mL of buffer solution
4. Dilute to 100 mL with distilled or deionised water
5. Add small quantity of Eriochrome Black T indicator mix
6. Immediately titrate with standard Na₂EDTA until colour changes from red purple to blue

Calculation: used mL Na₂EDTA 0.1 mol/L x 2.33 = %Vol. **riag AIX 652 Additive**