

# RIAG AIX 651

## Zincate process for pretreatment of aluminium and aluminium alloys

**RIAG AIX 651** 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
<b>RIAG AIX 651 Additive</b>	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 651 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 651 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 651 Additive** to the bath, and the first-aid procedures to follow in the event of accidental exposures to **RIAG AIX 651 Additive** liquid concentrates or solutions.

## Pretreatment

The aluminium surface must be cleaned thoroughly before the **RIAG AIX 651** treatment can take place. In this way, a uniform attack on the parts can be guaranteed.

## Maintenance

Determine **RIAG AIX 651 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 651 Additive** concentrate.

While **RIAG AIX 651 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 651 Additive** is highly alkaline and contains sodium hydroxide. Store in a tightly closed container.

Add **RIAG AIX 651 Additive** liquid concentrate to working solution carefully to avoid splashing.

**RIAG AIX 651 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 651 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 <sub>3</sub> /HF | 15 – 60 sec.  |
| 6) Double rinse   |            |                      |               |
| 7) Activate in <b>RIAG AIX 651</b>  | 15 – 25 °C |                      | 30 – 60 sec.  |
| 8) Double rinse   |            |                      |               |
| 9) Etching  | room temp. | HNO <sub>3</sub> /HF | 15 – 60 sec.  |
| 10) Double rinse  |            |                      |               |
| 11) Activate in <b>RIAG AIX 651</b>   | 15 – 25 °C |                      | 20 – 45 sec.  |
| 12) Double rinse  |            |                      |               |
| 13) Fresh water rinse, at least 5 minutes, when using a barrel 10 minutes   |            |                      |               |
| 14) <b>DURNI-COAT®</b> - process or another following process (we recommend <b>RIAG Ni 140</b> or a common Nickel process due to Watt with a pH around 4 or cyanide copper 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.

## 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.

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## Analytical control

Reagents: Na<sub>2</sub>EDTA 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 651** 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 Na<sub>2</sub>EDTA until colour changes from red purple to blue

Calculation: used mL Na<sub>2</sub>EDTA 0.1 mol/L x 2.33 = %Vol. **RIAG AIX 651 Additive**