Unistar Albond Dip SP

DILUTE ZINCATE PROCESS FOR PLATING ON ALUMINIUM

Unistar Albond Dip SP is a process for plating on aluminium which utilizes a dilute bath for activating the aluminium alloy

and applying a thin zinc film by immersion. This film can then be electroplated with copper, nickel or other deposits.

The dilute Unistar Albond Dip SP solution has a viscosity very near to that of water and as a result rapidly penetrates the

water film present on the aluminium when it is immersed in the bath. This produces a denser, more uniform zinc

film which has excellent adhesion to aluminium which, in turn promotes good/adhesion to subsequent electroplate.

The dilute Unistar Albond Dip SP solution easily penetrates into blind holes, crevices, screw threads, grooves and other

inaccessible areas which have been troublesome to plate using the conventional concentrated zincate bath. On large

flat areas of aluminium sheet, the dilute bath produces a uniform zinc deposit instead of streaked, uneven coating

often obtained from the viscous, concentrated baths.

When work is removed from **Unistar Albond Dip SP**, the thin liquid drains readily from even the most complicated parts,

thereby reducing dragout losses to the minimum. The thin film of solution which remains rinses off rapidly in a cold

water rinse.Flush the dilute zincate solution from pores in castings and from other areas which tend to entrap the

solution thus minimizing carry over of the zincate into subsequent plating baths. Blistering at porous castings is

also eliminated.

Unistar Albond Dip SP can be used to plate aluminium sheet, strip, castings, forgings, extrusions or stampings. It is

applicable to all commercially used aluminium alloys. The **Unistar Albond Dip SP** solution does not destroy the surface finish

of the aluminium, and the resulting electroplate will duplicate the finish of the metal surface prior to plating.

ADVANTAGES OF **Unistar Albond Dip SP**

Ease of make up

Free rinsing

Low dragout

Excellent adhesion

Uniform zinc coating on complex parts

Economical to use

Wide range of operating conditions

Transfer time not crtitical

Minimum carry over of Zincate into plating baths

Improved corrosion resistance at scratches, edges etc.

Excellent for plating screw threads, blind holes and porous castings.

EQUIPMENT

Unistar Albond Dip SP solution may be contained in plain steel tank, PVC polypropylene/ LDPE/HDPE/ or plastic lined tank.

MAKE UP

Unistar **Albond Dip SP** liquid is a prepared concentrate and is convenient to use. For make up, simply add Unistar **Albond Dip SP**

liquid to water at the rate of 200-500 cc/l depending on the type of Aluminium alloy. For aluminium diecasting use

full strength. For replenishment, add Unistar Albond Dip SP liquid directly to the operating solution as required.

CONTROL

The concentration of **Unista**r **Albond Dip SP** is not critical and the simplest control is by observing the gassing which occurs

at the surface of aluminium. As the solution becomes depleted, there will be a noticeable increase in gassing and

an increase in the time required to form a satisfactory zinc coating. At this point the solution should be replenished

with an addition of approximately 10% of the original make up or alternatively may be analysed as per following

method :

ANALYSIS

Apparatus Needed

5 ml Pipette

250 ml Erylenmeyer Flask

50 ml Burette

10 ml Graduate

50 ml Graduate

Spatula

Reagents Needed

0.1 M EDTA, disodium salt - dissolve 37.2 grams EDTA in deionized or distilled water and dilute to 1 litre. Triethanolamine,

50% by volume.

Indicator Powder : 1 gram of Eriochrome Black T indicator ground with 100 grams Sodium Chloride.

Buffer Solution : 125 grams AR grade ammonium chloride dissolved in concentrated AR grade ammonium hydroxide

and diluted to one litre with ammonium hydroxide.

Procedure

1. Take exactly 50 ml of Unistar Albond Dip SP working solution in a 100 ml volumetric flask and dilute it with deionized or

distilled water up to the mark.

2. Pipette out 5 ml of above diluted solution into 250 ml Erlenmeyer flask.

3. Add 40 ml of 50% triethanolamine

4. Add 10 ml of buffer solution

5. Dilute to 100 ml with deionized or distilled water.

6. Add 0.25 gm to 0.5 gm Eriochrome Black T Indicator

7. Immediately titrate with std. 0.1 M EDTA solution until colour changes from red-purple to blue.

Calculation

Unistar Albond Dip SP Concentration : No. ml EDTA titrated x 37.5 = ml/l **Unistar Albond Dip** SP

DETERMINATION OF NaOH CONTENT

Pipette out exactly 5ml of the sample into a 250ml conical falsk. Add 20ml of 1N HCl. To this add about 100ml of distilled

water. Titrate with 1 N NaOH using Phenol red indicator to red end point.

Calculation

NaOH (g/ltr.) = (20 - ml of NaOH used) x 8.0

Standard operating parameters of Unistar Albond Dip SP working bath to be maintained as per the following parameters

Zinc : 9 - 12 g/ltr.

Caustic Soda : 100 - 115 g/ltr.

NB : Zinc analysis may be done by AAS method.

TEMPERATURE

For all practical purposes, Unistar Albond Dip SP is used at room temperature.

Unistar Albond Dip SP

IMMERSION TIME

Time 15 seconds to 2 minutes. The immersion time depends on the temperature, the alloy being processed and

the pasivity of the aluminium surface. The temperature should be adjusted so that a uniform zinc coating forms in

not less than 15 seconds. Too long an immersion time will result in a spongy, poorly adherent zinc coating which

will cause blistering of the subsequent electroplate. A double dip may be used for better adhesion on certain

magnesium alloys, particularly those having high silicon and/or copper contents. This consists of a two minute dip

in Unistar Albond Dip SP stripping of the zinc costing in nitric acid and then re-immersion in Unistar Albond Dip SP for 15 seconds

to 2 minutes. The same nitric acid dip should not be used for both smut removal prior to the first dip in the

Unistar Albond Dip SP and for stripping zinc; use a separate nitric acid bath for zinc removal prior to double Unistar Albond Dip SP

immersion.

ALKALI CLEANING

Three types of alkali cleaning may be employed on aluminium alloys :

A. Non-silicated mild-etch cleaning for use where either no etching or only very mild etching is

desired and where silicate films produced by non-etch cleaners are undesirable Ginbond

NS-35 can be used.

B. Etch cleaning-for use where etching of the aluminium is desired for appearance or for superior adhesion where

brightness of plate is not essential. Use Ginbond E-24 at 45 g/l concentration and 70-80ºC for 15 seconds.

ACID DIPPING

Following mild etch or etch cleaning if the aluminium alloy contains only copper as an alloying constituent, a nitric

acid dip will remove the copper smut. If the alloy contains both copper and silicon, a nitric-Gictane 70 dip or a nitric

sulphuric-Gictane 70 dip is recommended. Acid dip formulations are as follows:

NITRIC ACID DIP

Nitric acid (36 ºBe) - 2 volumes

Water - 1 volume

Temperature - Room temperature

Time - about 15 seconds

NITRIC-GICTANE 70 DIP

Nitric Acid (36 ºBe) - 3 Volumes

Water - 1 volume

Gictane 70 - 120 g/l

Temperature - Room temperature with exhaust ventilation

Time - 5 to 15 seconds

NITRIC-SULPHURIC-GICTANE 70 DIP

Nitric acid (36 ºBe) - 2 volumes

Sulphuric acid (66 ºBe) - 1 volume

Water - 1 volume

Gictane 70 - 120 g/l

Temperature - Room temperataaure with exhaust ventilation

Time - 5 to 15 seconds

PLATING CYCLES

The specific plating cycle varies with aluminium alloy composition and the metal to be deposited. The services of

our laboratory are available to plate your sample parts and recommend a specific plating cycle for your use.

Typical cycle which can be used to plate many commercially used aluminium alloys is as follows:

1. Preclean to remove grease, oil and buffing compounds by vapour degreasing

2. Soak clean in Ginbond NS 35 for 1 - 5 minutes as required at 50-70ºC, using 30-60 g/l

concentration

3. Rinse in running cold water

4. Remove smut in a solution of 2 parts nitric acid, 1 part sulphuric acid and 1 part water by volume

containing 120 g/l Gictane 70 for 5 to 15 seconds at room temperature.

NOTE : For fast acting alloys such as 1100, 3003, 6061 it is helpful to use this mixed acid followed by a dip in

50% nitric acid at room temperature for 1-5 minutes to slow down the rate of formation of the subsequent Unistar Albond Dip SP coating.

5. Rinse in running cold water

6. Dip in Unistar Albond Dip SP for 15 seconds to 2 minutes as required at room temperature.

7. Rinse in running cold water

8A. Bright Nickel plate

OR

8B. Copper strike in Rochelle Copper Salt.

9. Rinse in running cold water

10. Plate with copper, nickel, silver, tin or other metals.

RACKING

Racking should be done by means of spring contact using stainless steel or aluminium wires. Good contact must

be ensured between the work and rack and between the rack and the bus-bar.

CAUTION

Unistar Albond Dip SP SOLUTION IS STRONGLY ALKALINE AND CONTACT WITH THE SKIN OR EYES SHOULD BE

AVOIDED.PROPER SAFETY PROTECTIVE CLOTHING SHOULD LBE USED WHEN THE MATERIAL IS HANDLED.