Adhesive Technologies

TECHNICAL INFORMATION
ALODINE 5992

1. INTRODUCTION

ALODINE 5992 is a product, trivalent chromium based, capable of producing a trivalent chrome conversion layer on aluminium and its alloys. According to the application and to the treated materials, the colour of the conversion layer changes from colourless to light green. The conversion layer is designed to improve paint adhesion and to increase anticorrosive protection. In the case of bare metal finishing it provides high corrosion protection and a low electrical contact resistance.

2. MATERIALS

Alodine 5992 MU – Make Up

Aldoine 5992 R – Replenisher

Toner 6

Neutralizer 700

3. EQUIPMENT

The tank and equipment for ALODINE 5992 should be constructed from stainless steel; Type 316 preferred for weldability. If necessary, heated tanks should be fitted with steamplate coils and side heating (for more even temperature distribution).

Detailed recommendations on equipment and specific process sequences are available from Henkel Technical Representatives.

4. THE PROCESS

The best application of ALODINE 5992 consists of the following steps:

A. Acid or Alkaline cleaning
B. Water rinsing
C. Acid de-oxidation
D. Water rinsing
E. Treatment with Alodine 5992
F. Water rinsing with DI water
G. Drying (suggested temperature < 80ºC)

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5. BATH MAKE UP

Fill the tank ¾ full with water. Add 30 to 250 kg of ALODINE 5992 MU for each 1000 litres of working volume. Add sufficient water to bring the solution up to the working level, mix thoroughly and determine the chrome pointage of the solution.

6. OPERATION

ALODINE 5992 is used at the following average working parameters:

(i) Bare corrosion protection

Concentration:	5 - 25%v/v
Chrome Pointage:	7.7 – 38.7
pH:	3.6 – 4.3
Temperature:	30 - 50ºC
Time:	0.5 - 2min (spray)
	0.5 - 10min (dip)
Spray Pressure:	0.5 - 1.5 bar

(ii) Pre-paint

Concentration:	3 - 6%v/v
Chrome Pointage:	4.7 – 9.4
pH:	3.6 – 4.3
Temperature:	30 - 50ºC
Time:	0.5 - 2min (spray)
	0.5 - 10min (dip)
Spray Pressure:	0.5 - 1.5 bar

Your Henkel representative will suggest the best working parameters and operating sequence according to the plant.

7. TESTING AND CONTROL

The ALODINE 5992 bath is controlled through the determination of chromium pointage and pH.

Chromium pointage:

(i) Take a sample of the bath solution and let it cool to room temperature.
(ii) Pipette 10mL of the bath into a 250mL beaker and add 2mL of hydrogen peroxide 3% solution.
(iii) Add 25mL of Titrating Solution No 89 (1N Sodium Hydroxide) and dilute to 100mL with water.
(iv) Heat slowly to boiling and boil for 30minutes. Add small amounts of water to maintain solution volume.
(v) Allow the solution to cool to room temperature, then add 20mL of Reagent Solution 135 (15% Potassium Iodide) and 10mL of Reagent Solution 44 and stir for 3 minutes. The solution becomes red/brown in color.
(vi) Titrate with Titrating Solution 104 (0.1N Sodium Thiosulphate) until the colour fades from red/brown to straw yellow.

Chromium pointage (cont):

(vii) Add 4-5 drops of Indicator No 10 (Vitex Iodine indicator). The solution becomes very dark in colour ; continue the titration until the solution turns from blue to clear.
(viii) The total consumption of Titrating Solution 104 (0.1N Sodium Thiosulphate) is the chrome pointage.

Calculation: Chrome Pointage x 0.645 = % v/v ALODINE 5992

Replenishment:

The bath is replenished with ALODINE 5992 R according to the chromium pointage. For each missing point add 0.65 kg of ALODINE 5992 R per 1000L of bath volume.

pH:

(i) Take a sample of ALODINE 5992 bath and allow to cool to 20ºC.
(ii) Standardise the pH meter with the correct buffer according to manufacturer's instructions.
(iii) Dry pH probe and immerse in sample of Alodine 5992 bath.
(iv) Allow meter to stabilise and take reading.
(v) Remove pH probe, rinse with distilled water and store in the correct solution.

pH Adjustment:

Use Neutralizer 700 to increase the pH and Toner 6 to decrease the pH.

Coating weight determination:

(i) Process a panel with a known surface area (S in m^2) through the process.
(ii) Take the panel before final drying and dry it with compressed air.
(iii) Then weigh the panel with an analytical balance to nearest 0.1 mg and record the value, W1 in gm.
(iv) Immerse the panel in a solution 1:1 59% HNO_3 at room temperature for 10 minutes.
(v) Then rinse the panel with DI water and dry it with compressed air, weight again and record value, W2 in g.

Calculation: Coating Weight (g/sq.m) = $\frac{(W1 - W2)}{S}$

It is advisable to maintain the coating weight value between 0.2 and 1.5g/sq.m (recommended range prior painting: 0.2 - 1.0 g/sq.m).

Your Henkel representative will recommend, case by case, possible changes to maintain coating weight in the right range.

8. PLANT MAINTENANCE

Water rinses are ideally dumped each day and made up afresh. Local Water Authorities should be consulted as to the allowable levels of contaminants that can be discharged to sewer.

Cleaning stages should be skimmed to keep the surface clean and the bath dumped when excessive soil accumulates in the bath.

9. SPECIFICATIONS

ALODINE 5992 meets the performance requirements of MIL-C-5541 specification.

10. PRECAUTIONARY INFORMATION

For specific information regarding safety and handling of the products used in this process please refer to the relevant Material Safety Data Sheet (MSDS).

DISCLAIMER