



TECHNICAL BULLETIN

135-141 Canterbury Road, Kilsyth Victoria 3137
Phone : (613) 9728 7200 Fax : (613) 9761 7179

ALODINE 1200S

A. SUMMARY

1. INTRODUCTION

Alodine* 1200S is a powdered chemical, used for producing paint bonding, corrosion resisting coatings on aluminium and its alloys by either spray or dip processing.

2. MAKE UP AND OPERATION

Alodine 1200S is usually made up at 7.5 kg per 1,000 litres of bath.

The **Alodine 1200S** powder should be predissolved in a bucket of cold water before adding to the main tank and the tank contents should be thoroughly stirred or recirculated through the spray system.

The same concentration of **Alodine 1200S** is normally used for both spray and immersion processes. The bath is operated at 24-30°C and controlled by pH and titration.

3. PROCESS SEQUENCE

1. Preclean.
2. Clean with **Ridoline*** cleaner.
3. Cold water rinse
4. Coat with **Alodine 1200S**
5. Cold water rinse
6. Passivation with **Deoxylyte***

Coatings are then usually dried and painted.

4. EQUIPMENT

The tank and equipment for **Alodine 1200S** should be constructed from stainless steel; type 316 preferred for weldability.

If necessary, heated tanks should be fitted with steam plate coils and side heating (for more even temperature distribution.)

Detailed recommendations on equipment and specific process sequences are available from a Henkel** Technical Representative.

B. TECHNICAL DETAILS**1. BATH MAKE UP AND CONTROL****(a) Make Up**

For each 1,000 litres of bath volume, add with stirring:

Water	900 litres
Alodine 1200S	7.5 kg

The **Alodine 1200S** should be predissolved in water before adding to the bath.

Mix and make up to volume (1,000 litres) with more water.

(b) Control Points (for normal operation)

	Immersion	Spray
Contact Times	60 - 90 sec.	15 - 30 sec.
Spray Pressure	N/A	50 - 80 kPa
Bath Pointage	5 - 7 ml	5 - 7 ml
pH	1.3 - 1.8	1.3 - 1.8
Temperature	24 - 30°C	24 - 30°C

See Section B3 for Test Methods

2. SURFACE PREPARATION

The **Alodine 1200S** system requires a perfectly clean surface for uniform results.

The work is usually cleaned with a **Ridoline** cleaner. Any corrosion products or heavy uneven oxide layer should be removed by immersion in a Henkel Deoxidiser or Aluminium Etchant.

Your Henkel Technical Representative will recommend the required cleaning procedure for each installation.

The **Ridoline** cleaner stages are usually followed by two 30 second or one 60 second unheated rinse.

The rinse is constantly overflowed to prevent build up of contamination products.

3. TESTING AND BATH MAINTENANCE

(a) General

The **Alodine 1200S** bath is controlled by pH measurement and one titration.

The pointage is determined regularly and determines the required amounts of **Alodine 1200S** to be added to replenish the bath.

(b) Bath Pointage

1. Standardisation of 0.1N Ferrous Ammonium Sulphate (Titrating Solution 31)

- (i) Pipette exactly 10.0 mls of 0.1N Potassium Dichromate Solution (Titrating Solution 30) into a flask.
- (ii) Add 30 ml Reagent Solution 44 (50% Sulphuric Acid).
- (iii) Add 4-8 drops of Ferroin Indicator (Indicator Solution 12).
- (iv) Titrate with 0.1N Ferrous Ammonium Sulphate (Titrating Solution 31) until the solution changes from green to blood red.
- (v) Record the number of millilitres of Titrating Solution 31 added as A ml.

$$\text{Standardisation factor (F)} = \frac{10.0}{A}$$

2. Bath Testing

- (i) Pipette a 5.0 ml aliquot of bath into a flask.
- (ii) Add 20 ml of Reagent Solution 44.
- (iii) Add 4-8 drops of Indicator Solution 12 (Ferroin) and mix.
- (iv) Titrate with standardised Titrating Solution 31 (0.1N Ferrous Ammonium Sulphate) until solution changes from green to blood red.
- (v) Record the number of millilitres of Titrating Solution added as B mls.
- (vi) Multiply no. mls. Titrating Solution 31 used B by Correction factor (F) determined above to calculate actual bath titration value.

2. Bath Testing (continued)

- (vii) Record the total no. of corrected Titrating Solution 31 used as the Alodine titration.
- (viii) To increase Alodine titration by 1 ml, add 1.25 Kg. of Alodine 1200S per 1000 litres of bath volume

(c) Bath pH

- (i) Standardise the pH meter with the correct buffer according to manufacturer's instructions.
- (ii) Dry electrodes and immerse in sample of **Alodine 1200S** bath.
- (iii) Take reading when meter stabilises.
- (iv) Remove electrodes, rinse with distilled water and store in the correct solution.
- (v) To decrease pH, add **Toner 6** at the rate of 1.25 litres per 1,000 of bath; allowing 15 minutes for bath to stabilise before rechecking. Under normal conditions, the addition of 500 ml of **Toner 6** per 1-2 kg of **Alodine 1200S** added to maintain bath concentration will also maintain pH in the desired range.

4. OPERATIONAL RECOMMENDATIONS

- (a) The initial charge and replenishment data contained herein are satisfactory for most installations. However, your Henkel Technical Representative may suggest a deviation from this data if indicated by local conditions.
- (b) If the **Alodine** coating is powdery, the cause may be one or more of the following:
 - pH too low
 - Temperature and/or concentration too high for treatment time
 - Work improperly cleaned or rinsed
 - **Alodine** bath contaminated - analysis required

4. OPERATIONAL RECOMMENDATIONS

- (c) If the coatings are uniform but iridescent the cause may be one or more of the following:
- pH too high
 - Concentration too low
 - Bath temperature too low for the contact time used
 - Contact time too short
 - Reaction products in solution - analysis required
- (d) If the coatings look patchy the cause may be one or more of the following:
- Cleaner bath exhausted
 - Incorrect cleaner used
 - More etching required

5. AFTER TREATMENT

(a) Cold Water Rinse

After immersion in the **Alodine 1200S** bath, the work should be rinsed for a minimum of 30 seconds in cold water. This tank should have a continuous overflow to lessen build up of contaminants.

(b) Deoxylyte Passivation

The work is then rinsed for 30 seconds with clean, salt free water containing **Deoxylyte 41** (for maximum corrosion resistance.) This stage may be operated hot to facilitate drying, and in some cases may avoid the need for a dry off oven.

(c) Drying

The work should then be dried in an indirect fired oven or by other means which will not contaminate the coating with oil fumes or partially burnt gases. The temperature should not exceed 82°C.

Solution trapped in cavities should be removed by suction, or with compressed air before drying.

6. 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.

7. HANDLING PRECAUTIONS

Alodine 1200S powder and baths are acidic, and poisonous.

Fume or spray vapour from an **Alodine** bath is toxic. **Alodine** baths should be situated in a positively ventilated areas.

If rags, paper or clothing contaminated with **Alodine** dry out, they constitute a fire hazard. Clothing should be promptly washed out and rags and paper should be disposed of in the wet state.

Operators handling **Alodine 1200S** powder or liquid and **Toner 6** should wear rubber gloves, respirators and eye protection.

If **Alodine 1200S** powder or liquid or **Toner 6** come into contact with the skin, immediately flush with water and seek medical attention.

8. SPECIFICATIONS

Alodine 1200S conforms to MIL-C-5541E Class 1A and 3 coatings, Methods A, B & C application.

9. GENERAL

(i) Electrical Resistance

Alodine coatings are electrically conductive. The resistance of a coating depends upon its thickness and its age. The lowest resistance is obtained with the lightest coatings and when coatings are fresh (i.e. <12 hours old) deoxidised surfaces allow a more uniform deposition (and hence lower resistance) to be obtained.

A typical figure for the resistance for a fresh coating with a weight around 500 mg/M² (45 mg/sq ft) would be 600 microhms. Conversely, the typical conductivity value is around 1,700 siemens.

(ii) Coating Flexibility

The flexibility of the conversion coating is equivalent to the base metal.

(iii) Coating Thickness

This usually ranges from 0.125 - 0.25 microns (0.005 - 0.1 thousandths of an inch.)

9. GENERAL

(iv) Solubility

The coating is insoluble in alcohol, water, organic and petroleum solvents.

It is soluble in strong acids or alkalis

(v) Coating Weights

Optimum production coating weights are determined by service and product requirements. Typical prepaint coatings range from 100-800 mg/M² (10 - 75 mg/sq ft).

10. HENKEL PRODUCT REFERENCE

**Alodine 1200S
Toner 6**

* Registered Trade Mark of Henkel Corporation USA.

** Registered Trade Mark of Henkel Australia Pty Limited.

DISCLAIMER

Any information given is, to the best of our knowledge, the best currently available, with respect to our products and their use, but it is subject to revision as additional knowledge and experience is gained. Such information is offered as a guideline for experimentation only and is not to be construed as a representation that the material is suitable for any particular purpose or use. Customers are encouraged to make their own enquiries as to the material's characteristics and, where appropriate, to conduct their own tests in the specific context of the material's intended use. This information is not a license to operate under nor is it intended to suggest infringement of any patent. We guarantee a uniform quality standard for this product. The only conditions and warranties accepted by Henkel in relation to this product or process are those implied by either Commonwealth or State statutes.