Henkel

Surface Technologies

BRUSH ALOCROM 1200

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PRODUCT DATA SHEET

1. PRODUCT DESCRIPTION

A rapid process which forms a protective golden coloured conversion coating on aluminium and its alloys. Outside the UK, the Alocrom range of products are marketed under the Alodine trade name.

2. FEATURES

Excellent corrosion resistance

Alocrom 1200 gives excellent protection against corrosion to both painted and unpainted aluminium surfaces.

Flexible adherent coating

Alocrom 1200 coatings are integral with the metal and will withstand bending and deformation of the surface.

Maximum paint adhesion

Alocrom provides an excellent foundation for paint.

Simple to apply

Alocrom 1200 requires no expensive equipment or skilled labour; it can be applied by brush or swab.

Approvals

Alocrom 1200 is approved to DEF-STAN 03-18, Certificate No. 031801 (including special approval for repairing damaged anodic coating) for use on aircraft.

3. USES

The Brush Alocrom 1200 process is designed for treating aluminium and aluminium alloy surfaces which are too large for normal dip or spray washing plant treatment, or for use where production does not justify the installation of expensive equipment. it is also used as a forming treatment over aged anodized or Alocrom treated surfaces prior to painting as specified in DTD 902E, and for touching up damaged areas on such coatings.

NOTE: Alocrom 1200 should be applied be applied by dip or spray washer wherever practicable as this gives a more uniform coatings. Details of these applications methods are given in the relevant Product Data Sheets.

4. PROCESS

4.1 Solution Make-up

Brush Alocrom is supplied as two liquids (Brush Alocrom 1200 liquids Parts A and B) in 20 kg packs containing 10 kg Part A and 10 kg Part B.

To make up the working solution mix equal volumes of Parts A and Part B in a plastic container. Stir to ensure thorough mixing.

MAKE UP ONLY SUFFICIENT MIX FOR USE WITHIN 24 HOURS. IF ANY MIX REMAINS AFTER 24 HOURS DISPOSE OF IT. (SEE 'PRECAUTIONS' BELOW).

4.2 Precleaning

Remove oil, grease, oxide coatings, corrosion products, etc with Deoxidine 624 as described in the Product Data Sheet, or by solvent wiping followed by rubbing with Scotchbrite* pads. If the surface is oxide free thorough solvent wiping is usually satisfactory provided the Alocrom 1200 wets the surface when it is applied.

Where Alocrom 1200 is to be used for touching up machined, abraded or damaged areas on anodized or Alocrom treated surfaces, clean the areas by solvent wiping.

4.3 Alocrom Treatment

Apply the Brush Alocrom mix to the surface by brush or swab. Do not apply by spray-gun or any equipment which atomises the solution into the atmosphere.

* Scotchbrite is manufactured by 3M company.

Always apply evenly and liberally, working upwards on vertical surfaces. The best method is to use a nylon brush, but large paint brushes are also suitable and satisfactory results can be obtained with a viscose sponge or cotton rags* soaked

in the solution. Vertical surfaces can also be treated by applying absorbent paper* soaked in the Alocrom 1200 solution, this is particularly useful where only a specific area needs treating.

Treat small areas at a time, making sure that the area being treated is uniformly wetted and apply fresh solution if necessary. If there is poor wetting or bare areas remaining after treatment, then the precleaning was inadequate and some oxide is probably still present. Reclean such surfaces with Deoxidine 624 or Scotchbrite and treat again with Brush Alocrom 1200.

Allow the Alocrom 1200 to act on the surface until an iridescent golden to golden yellow coating is obtained. This will take 1-5 minutes depending on the activity and temperature of the surface.

* See Section 6 for precautions to be observed when using these materials.

4.4 Rinsing

Remove excess Alocrom from the surface by flushing with clean water or gently swabbing with a soft sponge or cloth. Rinse finally with demineralised water wherever possible.

4.5 Drying

Air dry, blow with clean compressed air or gently wipe with clean cloths. Oven drying for approximately 10 minutes at 120°C is beneficial if 2-pack Epoxy Primer is subsequently applied.

NOTE : The freshly formed Alocrom 1200 coating is quite soft and care must be taken not to damage it during rinsing and drying. When dry, Alocrom treated parts may be painted or put into service without further treatment. There is no time limit before which paint must be applied, but if parts are to be painted this should be done as soon as possible to minimise contamination.

5. EQUIPMENT

Containers for the Alocrom solution should be made of stainless steel, plastic, synthetic rubber or other acid resistant material; lead, glass, tin and galvanised iron are not suitable. **The mixed solution should not be stored (See 6 below).**

6. HAZARDS AND HANDLING PRECAUTIONS

Brush Alocrom 1200 Part A contains chromic acid and complex fluoride. Brush Alocrom 1200 Part B contains potassium ferricyanide.

Mix only sufficient Brush Alocrom for use during the subsequent 24 hour period. If the mixture of Parts A and B are stored for longer than 24 hours small quantities of toxic cyanide gas may be formed. Discard any of the unused mixture after 24 hours.

When handling and applying Brush Alocrom 1200 wear PVC or rubber gloves, apron and rubber boots. Wear chemical goggles and/or a face shield to BS 2092. Handle and use only in conditions of good ventilation.

Avoid splashes. If Alocrom solution gets on to the skin, immediately drench with water and continue washing with soap and water. Get medical attention if irritation or a skin rash develops.

If Alocrom is splashed in the eyes flush with large amounts of cool water and continue irrigation for at least 10 minutes and **GET MEDICAL ATTENTION IMMEDIATELY.**

Do not allow rags, sponges or any organic material (eg. paper or sawdust) which are wet with Alocrom to dry out as they may then constitute a fire hazard. Wash rags etc. in water immediately after contamination and discard them into a non-flammable container.

Hose any spills of Alocrom to drain with plenty of water. **DO NOT USE SAWDUST** to absorb the liquid.

Store the Alocrom liquids, in a cool, dry, well ventilated area away from foodstuffs, oxidisable, organic or flammable materials.

Full information on the hazards and safe handling of the products as supplied are given in the Health & Safety Sheet which must be read and understood by everyone handling or using this product.

7. FURTHER INFORMATION

Full information on the hazards and safe handling of the product as supplied is given in the Health & Safety Data Sheet which must be read and understood by everyone handling or using this product.

The details given in this data sheet reflect our current technical knowledge and experience, and are not a legally binding assurance of characteristics or suitability for a specific purpose. Users must satisfy themselves that there are no circumstances requiring additional information or safety precautions relating to details given herein and must not practise or use any patented invention or trademark without prior approval.

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Surface Technologies

ALOCROM 1200 DIP

PRODUCT DATA SHEET

1. PRODUCT DESCRIPTION

A rapid non-electrolytic dip process which forms a protective golden coloured chromate coating on aluminium and its alloys.

2. FEATURES

Excellent Corrosion Resistance

Alocrom 1200 gives excellent protection against corrosion to both painted and unpainted aluminium surfaces.

Flexible Adherent Coatings

Alocrom 1200 coatings are integral with the metal and will withstand bending and denting of the surface.

Maximum Paint Adhesion

Alocrom 1200 provides an excellent foundation for paint and other organic finishes.

Short Immersion Time

Alocrom 1200 requires only a few minutes for coating formation.

Negligible Heating Costs

Alocrom 1200 operates at room temperature and the work can be air dried where convenient.

Low Coating Costs

For a medium weight coating only about 0.25 kg of Alocrom is used in processing 100 m² (1000 sq ft) of metal surfaces.

Low Electrical Resistance

Light to medium Alocrom coatings have minimum effect on surface electrical resistance. The contact electrical resistance is less than 5000 micro-ohms per square inch measured under an applied electrode pressure of 200 pounds per sq inch. (MIL-C-5541 method).

Approvals

Alocrom 1200 is approved to DEF STAN 03-18 Certificate No. 031801 for use on aircraft, (including special approval for repairing damaged anodic coatings). Outside the UK the process is known as Alodine 1200; Alocrom 1200 and Alodine 1200 are chemically identical.

3. USES

Alocrom 1200 is ideal for coating all types of aluminium and aluminium alloys including high silicon pressure die-castings. It should be used on aluminium wherever maximum corrosion resistance is required, and is suitable for articles which are to be painted or left unpainted. Its uses include general industrial work, electrical components, domestic appliances, car body parts and aircraft components. **Alocrom 1200** is unaffected by steel, brass or copper inserts in the articles being processed and can be used for treating zinc and aluminium in the same bath.

Alocrom 1200 is unsuitable for producing a decorative effect on unpainted alloys which are subject to exterior weathering since some change in colour may occur under these conditions. The process should not be used to treat foodstuffs containers.

For large scale continuous production, **Alocrom 1200** may be applied in a conventional spray washing plant. A Product Data Sheet on Spray **Alocrom 1200** is available.

For brush application use only Brush Alocrom 1200 liquid. This product is supplied as a two pack product. **Do not use the powder to make up Alocrom 1200 for brush application** and especially **do not store working strength brush Alocrom 1200 solution** as toxic cyanide fumes can accumulate in a closed container.

4. ALOCROM 1200 BATH CONTROL POINTS

Temperature	:	18-27°C (65-80°F)
Immersion Time	:	2 - 5 minutes
Coating Weight	:	0.3 - 2.0 g/m² (30-200 mg/sq ft)
Chemicals Required	:	Alocrom 1200 powder. Nitric Acid may also be required
Bath Make-up	:	8 kg Alocrom 1200 per 1000 litres of water
Bath Strength Titration	:	3.3-4.0 cm^3

5. PROCESS

The complete pretreatment process consists of the following steps :

a) Preclean by solvent vapour degreasing or by using a suitable Ridoline or Almeco cleaner plus water rinse.

b) Deoxidise or Desmut where necessary followed by a water rinse.

c) Alocrom treatment.

d) Water rinse.

e) Deoxylyte rinse and/or deionised water rinse.

See Section 7 - OPERATING NOTES for further details concerning steps a) and b).

6. ALOCROM 1200 BATH MAKE-UP

6.1 Chemicals Required

The process requires Alocrom 1200 powder and, in some cases, small regular additions of concentrated nitric acid during replenishment.

6.2 Precautions for Make-Up and Replenishment

Before opening the **Alocrom 1200** container refer to Section 12 - HANDLING PRECAUTIONS.

6.3 Make-up

Fill the bath to its operating level with water. Deionised or distilled water is recommended to prevent calcium or magnesium salts precipitating out and reducing the efficiency of the bath. Slowly add 8 kg of **Alocrom 1200** powder per 1000 litres of water (8 lbs per 100 glns) and stir well until the powder has completely dissolved. The tank extract system must be running during bath make-up.

For the best results, a new bath should age for 24 hours and it should therefore be made up at least a day before production commences.

7. ALOCROM 1200 BATH CONTROL

7.1 Alocrom Titration

a) Adjust the Alocrom bath to its normal working level with water and stir.

b) Pipette 5 cm^3 of the Alocrom bath into a 250 cm^3 flask and dilute to about 100 cm_ with water. Take care that none of the solution is spilt throughout the test.

c) Add about 1 gram of potassium iodide (Test Chemical No. 71) and agitate to dissolve.

d) Add about 5 cm^3 of concentrated hydrochloric acid (Test Chemical No. 72) and mix. Leave to stand for about 1 minute.

e) Titrate the solution with 0.1N sodium thiosulphate (Titrating Solution No. 4) until a straw colour is obtained.

f) Dissolve about 0.5 grams of iodine indicator (Indicator No. 52 - Iotect) in water and add to the flask. A blue-black colour will be obtained. Continue the titration to the colourless end point.

The number of cm^3 of sodium thiosulphate added is the strength titration of the bath and this should be maintained at 3.3 - 4.0 cm^3. Add 2 kg of Alocrom 1200 powder per 1000 litres of bath for each cm^3 below the required value.

Refer to Section 12 - HANDLING PRECAUTIONS before opening the Alocrom 1200 container

7.2 pH Control

For correct coating formation, Alocrom baths should be operated at a pH between 1.6 and 2.2. If the coating takes longer to form than normal and is lighter coloured or non-adherent, this indicates that the pH is rising and it should be lowered by adding concentrated nitric acid when

replenishing the bath. Initially, add 100 cm^3 of acid for each 4 kg of Alocrom needed to replenish the bath; if necessary increase the amount in 100 cm^3 increments, up to a maximum of 1 litre/4 kg until consistent coatings are obtained. The amount of nitric acid added must be kept as low as possible and the maximum must not be exceeded. After each addition of acid, wait for several hours before adding more acid to ensure the bath has reached equilibrium.

If preferred, the pH can usually be lowered by increasing the Alocrom concentration rather than adding concentrated nitric acid. To do this add Alocrom in 1 gram per litre increments until consistent coating are obtained. The total Alocrom concentration must not exceed 14 kg per 1000 litres which corresponds to a titration of 7 cm^3. Once the optimum operating strength for a particular plant has been established, the bath should be maintained at that strength by small additions of Alocrom 1200 powder as indicated by titration.

8. OPERATING NOTES

8.1 Precleaning

Remove all grease by solvent vapour degreasing or by using Ridoline or Almeco cleaner. Rinse where necessary.

If the oxide skin is very light no further precleaning is required. However, if the oxide skin is heavier eg. on extrusions, heat treated sheet aluminium or cast alloys etc, it will normally need removing with Deoxidiser. See Data Sheet on Deoxidisers 1, 2 and 7/17 for details.

Copper containing alloys tend to smut in etching alkali cleaners and the copper smut should be removed by dipping the component in 10% nitric acid or Deoxidiser 1. Alloys containing more than about 1% of silicon, such as those commonly used for die castings, give a silicon smut if etched in alkali and this cannot be removed by nitric acid or any other practicable methods. Such alloys are best solvent degreased and given a light etch in Deoxidiser 1 before the Alocrom treatment.

8.2 Alocrom Treatment

Immerse in the Alocrom 1200 bath for 2-5 minutes at 18-27°C (65-80°F). After removing the work from the bath allow it to drain over the tank for 15 seconds. This will avoid unnecessary contamination of the rinse and reduce drag out losses.

8.3 Alocrom Coating Control

Baths operating correctly give thin, adherent coatings ranging in colour from iridescent gold to golden yellow. Typical coating weights are in the range 0.3 to 2.0 g/m² (30-200 mg/sq ft).

If the coating does not form or is too light or too iridescent, the cause may be one or more of the following:

a) The bath temperature is too low for the immersion time.

b) The immersion time is too short.

c) The concentration of the bath is too low.

d) The pH of the bath is too high.

e) Heat treatment residues or an oxide layer on the metal surface are preventing coating formation, these can be removed with Deoxidiser (see relevant Data Sheet for details).

f) The bath has been overheated. This can permanently upset the chemical balance of the solution.

g) The bath has become contaminated with phosphates, sulphates, etc., from a prior cleaning bath.

If the coating is too heavy or dark, the causes may be one or more of the following:

a) The bath temperature is too high for the immersion time.

b) The immersion time is too long.

c) The concentration of the bath is too high.

d) The pH of the bath is too low.

If the coating is powdery, the cause may be one or more of the following:

a) The work has been improperly cleaned and/or rinsed.

b) The bath has become contaminated.

c) The surface oxide has not been adequately removed. Treat with Deoxidiser.

8.4 Alocrom Bath Maintenance

Restore the working level of the bath regularly with water to make good evaporation and drag-out losses.

If any sludge accumulates and begins to interfere with the processing, the bath should be cleaned out. To do this allow the sludge to settle, siphon or pump the clear solution into the emptied rinse tank and discard the sludge. Wash out the Alocrom tank and return the solution. Fill the bath up to its operating level with water and add Alocrom to bring the bath to its working strength.

Alocrom baths have a very long life and for all practical purposes need never be discarded.

9. RINSING

Rinse for 15-30 seconds in clean running water. The rinse water flowing to drain will contain a low concentration of chromates (hexavalent chromium). A typical figure would be 15 mg/l (ppm) Chromium (as Cr), and this may need effluent treatment to satisfy the requirements of the Drainage Authority. Details of a simple effluent treatment method will be supplied on request.

If the work it to be painted, rinse finally in water containing Deoxylyte (see the relevant Product Data Sheet for details). To help dry the work this rinse can be heated to 50-70°C (120-160°F). Deoxylyte in the final rinse counteracts the effects of any hardness in the final rinse water and improves the corrosion resistance. It also acidifies the surfaces before drying and thereby ensures good paint adhesion even under prolonged humid conditions. Alternatively, Alocrom 1200 can be used for the same purpose. Add 50-250 grams of **Alocrom 1200** per 1000 litres of final rinse. The pH should be 3-5. Deionised water may be required to achieve this pH.

The final rinse must be kept clean and it should be renewed once a day or, for continuous production, once a shift.

Use deionised or distilled water for final rinse make-up if possible.

10. DRYING

Air or oven dry the work. Oven drying speeds up production and a temperature of 70°C (160°F) is generally suitable but temperatures up to 140°C (280°F) may be used where necessary. At higher temperatures, there may be some loss of corrosion resistance, particularly on copper bearing alloys or where articles are to be left unpainted.

There is no restriction on the stoving temperature of paint or other organic coatings applied over the Alocrom.

The freshly formed Alocrom coating is quite soft and care must be taken not to damage it during rinsing and drying. When dry, Alocrom treated parts may be painted or put into service without further treatment.

Operators should wear cotton gloves when handling freshly treated work.

11. REMOVAL OF ALOCROM COATINGS

Fresh **Alocrom 1200** coatings may be removed without seriously etching the aluminium by immersing in 50% nitric acid or in the Deoxidiser bath. Aged coating or those which have been heated are very resistant to chemical methods of removal and an etching alkali will be necessary.

12. EQUIPMENT

The equipment consists of:-

a) Degreasing plant with suitable rinses where required and if necessary a Deoxidiser or Desmut tank and rinse.

b) An Alocrom tank constructed of 18 gauge type 316 (En58J) stainless steel or rigid PVC, neoprene, polypropylene, glazed fibre glass or polythene. Rubber, lead, ceramic or glass are not suitable. It is not usually necessary to heat the tank but if the temperature of the shop is likely to fall below 18°C (65°F), a steam coil or electric immersion heater should be fitted to the tank. The solution deteriorates rapidly if heated above 35°C (95°F) and a thermostat **MUST** be fitted to a heated tank. Overheating the Alocrom may result in the formation of toxic fumes.

   The tank should be sited in a well ventilated area and fitted with a properly designed extract system. As a guide, air velocity across the Alocrom should be about 25 m/min. Tanks over 75 cm^3 wide should have extract slots on both sides. Typical slot velocity will be 700 m/min.

   Further information on tank extract design can be obtained from 'Industrial Ventilation' published by American Conference of Government Industrial Hygienists (ACGIH).

c) An unheated water rinse tank and a final dilute Deoxylyte or dilute Alocrom rinse tank. Both rinse tanks can be made of mild steel or galvanised steel; the water rinse tank should have a continuous supply of water, a weir overflow and a draining valve; the final rinse tank should be fitted with heating coils.

d) A well ventilated oven for drying the work if required.

Work can be handled on hooks or in baskets or tumbling barrels. Containers which are immersed in the solution should be of stainless steel, heavy gauge aluminium or plastic coated mild steel. Care must be taken to ensure that the solution can circulate freely to all parts of the work.

Henkel Surface Technologies can accept no responsibility for the accuracy or otherwise, of information, provided in good faith, which concerns plant, equipment or materials supplied by a third party.

13. HAZARDS AND HANDLING PRECAUTIONS

13.1 Alocrom 1200 as supplied

Full information on hazards and safe handling of the chemical as supplied is given in the Health and Safety Data Sheet which must be read and understood by everyone handling or using the product.

Alocrom 1200 contains chromium trioxide (chromic acid) complex fluoride salts and potassium ferricyanide (potassium hexacyanoferrate III).

When handling the products wear PVC or rubber gloves, apron and rubber boots. Wear chemical goggles and/or a face shield which conforms to BS 2092 and 'The Protection of Eyes Regulations 1974'. Wear a dust mask to BS 2091. Handle only in conditions of good ventilation.

OPEN CONTAINERS OF ALOCROM WITH CAUTION AND ALLOW ANY VAPOURS TO DISPERSE AND ANY DUST TO SETTLE FOR SEVERAL MINUTES BEFORE HANDLING THE POWDER. DO NOT BREATH THE DUST.

13.2 Alocrom working bath

Operators should wear chemical goggles and/or a face shield which conforms to BS 2092, and PVC or rubber gloves.

First Aid:-

Skin Contact

Remove contaminated clothing immediately. Drench the affected area with water and continue thorough washing with soap and water. Get medical attention if irritation or a skin rash develops.

Eye Contact

Flush eyes with large quantities of cool water holding eyelids apart. Continue irrigation for at least 10 minutes. **GET MEDICAL ATTENTION IMMEDIATELY.**

Small spills should be hosed to drain with plenty of water.

Do not allows rags, sponges, paper or any organic matter which has become contaminated with Alocrom to dry out as this may constitute a fire hazard. Wash rags etc. with water and discard to a fireproof container.

14. FURTHER INFORMATION

Full information on the hazards and safe handling of the product as supplied is given in the Health & Safety Data Sheet which must be read and understood by everyone handling or using this product.

The details given in this data sheet reflect our current technical knowledge and experience, and are not a legally binding assurance of characteristics or suitability for a specific purpose. Users must satisfy themselves that there are no circumstances requiring additional information or safety precautions relating to details given herein and must not practise or use any patented invention or trademark without prior approval.

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