Etchant and deoxidizer for Aluminum

1 General Description

The Ardrox® 295GD process is a liquid concentrated acidic multi-component product for the etching and deoxidizing of aluminum alloys after cleaning or etching. The Ardrox® 295GD is free of chromates and can be used instead of “sulfuric-chromic” processes. The Ardrox® 295GD is used to prepare the surface prior to welding, bonding and conversion coatings, such as anodizing, chromate conversion coating or the new trivalent chrome or non-chrome processes.

Approvals

✓ AIRBUS AIPI 02-01-003
✓ AIRBUS UK ABP 8-1296

1.1 Chemicals Required

ARDROX® 295GD : Make-up product
GARDOBOND® Additive H 7262 : Complex Etch Activator

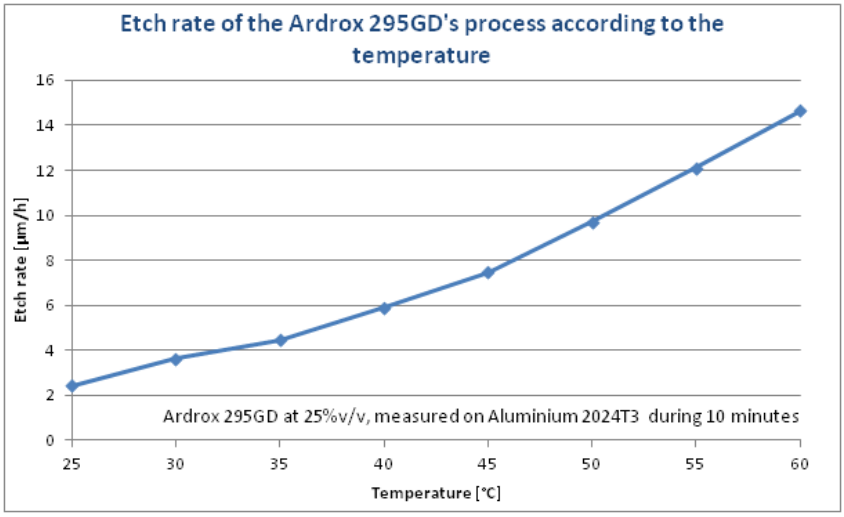
2 Physical and Chemical Properties

Property	Unit	Typical Value	Test Method
Appearance	-	Dark brown liquid	-
Density	g/ml	1.4 @ 20°C	-
pH	-	<1	-

These are typical values only and do not constitute a specification.

3 Application

Ardrox® 295GD can be used at room temperature and up to 40°C. The depth of etch will increase with the temperature of the bath. Dip the parts for the relevant time to achieve the desired depth of etch (cf. the curve reported below). In order to ensure a good homogeneity, it is recommended to agitate the bath for the duration of the treatment. After etching, parts must be rinsed with DI water.



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4 Bath

4.1 Bath Makeup

Half fill the tank with DI water. Progressively add the quantity of Ardrox® 295GD, which you have previously calculated for a concentration between 20 and 25% v/v. Top up with cold water until you reach the required working level.

4.2 Method of Control

Required chemicals:

- ✓ Sodium Hydroxide (NaOH) 1N
- ✓ Sodium Thiosulfate 0.1N
- ✓ Potassium Iodidee
- ✓ Starch Solution 1%
- ✓ Sulfuric acid 50%

- Oxidizing function (FO)

1. Transfer 10 ml of the bath sample into a 250 ml capacity Erlenmeyer.
2. Add 100 ml of DI water, 5 ml of 50% H_2SO_4 and 10 g of Potassium Iodide.
3. Agitate until the powder is dissolved and leave it for 20 minutes protected from day light.
4. Add 5 droplets of Starch Solution.
5. Titrate with the Sodium Thiosulfate 0.1N until discoloration. Be V_1 the volume of Sodium Thiosulfate used.

[Oxidizing Function] (%) = V_1

- Acidic function (FA)

1. Transfer 10 ml of the bath sample into a beaker.
2. Add some DI water until you can immerse the pH electrode.
3. Agitate the solution and read the pH continuously.
4. Neutralize to pH 6 with the Sodium Hydroxide 1N solution (the bath becomes brown!) Be V_2 the volume of NaOH 1N used:

[Acidic function] (%) = V_2 x 1.1

4.3 Replenishment of the bath

Important! Titrate and replenish in the following order: first, titrate the oxidizing function, then the acidic function, and eventually the depth of etch.

Per 1000 L of bath solution
Oxidizing function: add 6.66 L of Ardrox® 295GD
Acidic function: add 12 L of Ardrox® 295GD
Depth of etch: add Gardobond® Additive H 7262 until the expected depth of etch is recovered

Comment: If the step before the Ardrox® 295GD is an acidic etchant, the acidic function might increase steadily; however, the limit of twice the oxidizing function shouldn't be passed. If so, the bath should be renewed or diluted in order to decrease the acidic function.

5 Effects on materials

No significant effect is likely to be encountered on plastic materials (like PMA, PVC or rubbers) when Ardrox® 295GD is used in the prescribed manner. As conditions of use may vary considerably, particularly when dissimilar metals are in close contact, intending users are advised to check their specific requirements in this respect.

6 Equipment materials

Tanks and equipments used for running the Ardrox® 295GD process shall be made of alloy 316 stainless steel or lined with polypropylene, CPVC, PTFE (Teflon) or PVDF (Kynar) or other material as approved by the equipment manufacturer.

7 Storage

Store in a cool place, protected from freezing conditions.

8 Safety guidance

Before operating the process described it is important that this complete document, together with any relevant Safety Data sheets, be read and understood.

9 Waste release

Any release shall respect all the applicable national and local regulation.

10 General information

Chemetall supplies a wide range of chemical products and associated equipment for cleaning, descaling, paint and carbon removal, metal working and protection and non-destructive testing. Sales Executives are available to advice on specific problems and applications.

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