

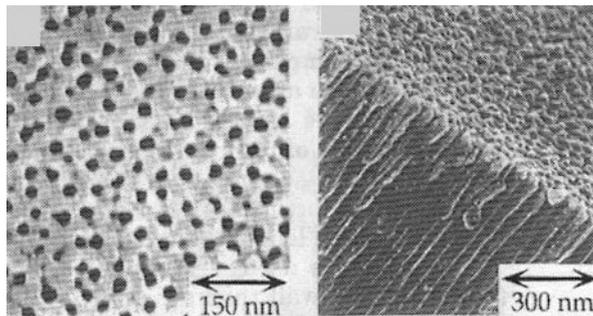
*Printing on anodized aluminium*

**Manual**

# 1. Introduction

## 1.1. What is anodized aluminium

When exposed to air at room temperature, pure aluminium passivates by forming a surface layer of aluminium oxide 2 to 3 nm thick. Anodizing aluminium in electrolytic solutions with electric current applied allows growing thicker oxide layers. Aluminium alloys are anodized to increase corrosion resistance, surface hardness, and to allow dyeing (colouring).



*Surface and cross section near the outer surface of porous oxide  
(From T. Kyotani, L. Tsai, and A. Tomita, Chemistry of Materials, Vol. 8, p 2109, 1996).*

The sulphuric acid anodizing process produces a porous surface with a thickness of around 20  $\mu\text{m}$  which is ideal for printing. Photo quality images and graphics in vivid colour may be printed into the unsealed porous oxide layer using colour dyes via a digital ink jet printer.

Please note that the pores of anodized aluminium will start to close in contact with air. After a few hours the ink can no longer penetrate the pores correctly. To prevent this, material offered for digital printing uses a protective coating that prevents the pores from closing. This material has a shelf life of several months.

## 1.2. Advantages of printed anodized aluminium

Once the dyes are printed into the pores and dried, they will be fixed in hot water. The hot water will seal the pores, so the dyes are enclosed and fully protected from outside influences. This makes the printed image very resistant to:

- Mechanical abrasion / Scratches
- Solvent agents such as: Alcohol, Acetone or Thinner
- Aqueous solutions
- High temperatures (up to 650 degrees Celsius)
- Graffiti: Foreign colour can be easily wiped off with paint thinner

### **1.3. Fixation in seal bath**

#### **Introduction**

To seal the pores of the anodized aluminium we use a hot water bath. We offer a sealing tank with material baskets to hold the material in place during fixation.

The bath is filled with a mixture of tap water and sealing salt. The sealing salt comes as a liquid solution that is mixed with the water. The sealing salt improves the sealing performance and prevents the colour from bleeding during the process.

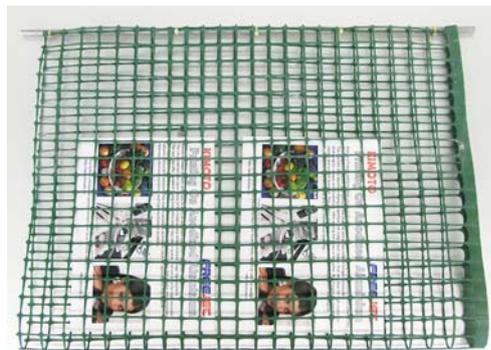
The fixation time is 45 minutes for normal applications but can be extended to 90 minutes if needed.

#### **Preparation**

1. Connect the seal tank to a 230V outlet
2. Fill the tank with a mixture of tap water and sealing salt.  
The correct mixture is: 50ml Sealing salt per 1000ml of water
3. Set the temperature to approximately 95 degrees and switch the bath on.
4. It may take up to 1 hour for the bath to reach the desired temperature.



**Sealing Tank**



**Material basket**

#### **Maintenance**

- The water/salt solution needs to be changed every 6 months
- Due to evaporation the bath needs to be replenished with additional water and salt as needed.

Make sure the material is completely covered in fluid during fixation!

## **Fixation**

1. Wait until the bath reached its operating temperature of 95 degrees
2. Insert the printed plates into the material basket
3. Enter the Material baskets into the bath as shown below



4. Close the lid of the tank to minimize evaporation
5. It takes 45 minutes to complete the fixation process
6. After finishing, remove the baskets with the material
7. To finalize the material needs to be cleaned

### **1.4. Final cleaning**

1. Rinse the finished plates in warm water to remove salt stains
2. Let the material dry before cleaning or dry it with a cloth
3. Use the Eco cleaner on a cloth or paper towel
4. Thoroughly clean the surface to remove all remaining stains.  
The cleaning also removes rests of the protective coating that is necessary for printing.