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# Purpose

The purpose of this procedure is to describe the process used to remove the thick film silver electrode from ceramic crystals.

# Responsibilities

Crystals Department Engineering is responsible for maintaining this procedure.

Crystals Department Management and Technicians are responsible for carrying out this procedure.

## Affected Department / Product Group / Support Group

Crystals Department

## Associated Documents

ISO 9001, QAM, QSM, AS9100

# Procedural Notes

## General Description and Practice

This procedure defines the processes used to remove fired on silver electrodes from ceramic pieces. This is done to aid the lapping process. It has been found through experiment that removing the silver electrode in this manner improves the consistency of the lapping process.

## Safety Precautions

The operator may come into contact with the following materials and equipment that requires caution:

* Acid/Base solutions
* Volatile solvents

Common sense and good laboratory practice should be used at all times.

IN THE CASE OF ANY INJURY, INFORM YOUR SUPERVISOR IMMEDIATELY.

### Handling Acids and Bases

* In any operation that calls for the use of strong acids or bases, use rubber gloves, yellow aprons and sleeves and safety goggles.
* Avoid all contact, especially the eyes, with these strong solutions and avoid breathing the vapors.
* Always prepare and use the solutions in the fume hood.
* Avoid splashing and spills of any of the acid or base solutions. If for any reason some of the acid comes into contact with the skin, flush immediately with water for a minimum of 5 minutes and neutralize with soda from the acid spill kit. An Emergency Eyewash station and shower is available in the lab and should be used if necessary.
* In the case of any accidents, inform your supervisor.
* Where there is a major spill not in contact with the skin, call your supervisor and then neutralize an acid with soda or dilute a base with water and then clean as with any spill.
* When mixing an acid solution, always add the acid to the water.

### Handling Volatiles Solvents

* With volatile solvents such as methanol, the vapors should not be inhaled. These solvents should be used in a fume hood whenever possible.
* Most of these solvents are usually extremely flammable and those flames may not be visible.
* These solvents should not be used in the same fume hood as or come into contact with any acids.

## Lot Sizes

The lot size for a particular part number will be defined by the fixture and will be indicated on the job paperwork.

## Equipment

* 12” plastic plating tank, labeled “Silver Stripping”, and lid
* 12” plastic plating tank, labeled “Methanol”, and lid
* 10” x 3” rinsing tank
* Fixture, as indicated on the job paperwork
* Convection Drying Oven, set to 90°C

## Chemicals

* DI Water
* ACS/Reagent Grade 69% Nitric Acid, diluted 50/50 with DI water (PCB p/n 100-8374-20)
* ACS/Reagent Grade Methanol (PCB p/n 100-8374-70 / 100-17228-40)

# Setting up for Stripping

NOTE: Operators must wear gloves, goggles and yellow aprons when handling these chemicals. Avoid splashing the solutions when handling.

NOTE: The methanol should not be used in the same fume hood as or come into contact with the Nitric Acid.

* 1. Retrieve the two plating tanks labelled “Silver Stripping” and “Methanol” and place them in two different fume hoods.
	2. Clean the tanks by rinsing them with flowing DI water until visually clean.
	3. Place the rinsing tanks in the sinks and begin filling it to overflowing with DI water.
	4. Pour 3-4 inches of each solution into the respective tank, being careful not to splash. The height of the solutions only needs to be enough to completely submerge the crystals.
	5. Lid each tank to prevent contamination.

# Stripping Procedure

NOTE: Operators must wear gloves, goggles and yellow aprons when handling these chemicals. Avoid splashing the solutions when handling.

* 1. Load the parts to be stripped into the fixture(s).
	2. Submerge the fixture of parts in the Silver Stripping solution for no more than 5 minutes.

NOTE: This only needs to be done until the parts are visually free of silver on both sides. If the reaction takes more than 5 minutes, the stripping solution is spent and should be replaced.

* 1. Rinse the parts in the overflowing DI water tank in the sink for 3 minutes. Dump tank after rinsing is complete.
	2. Rinse the parts in the Methanol by dipping 10 times.

NOTE: This is done to displace the water from the parts and aid the drying process.

* 1. Dry the parts in the drying oven at 90°C until they are visually dry, for 1-3 minutes.
	2. Repeat this process for the remaining parts in the job.

## Clean Up and Disposing of Spent Solutions

The Silver stripping solution and Methanol may be used multiple times before it is spent – but no longer than one week. Spent Silver Stripping solution should be poured into the Waste Acid drum. Spent Methanol should be poured into the Waste Solvent drum. After this, the tanks and lids should be rinsed thoroughly with flowing DI water before refilling with new solution.