P006
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Safety Note: To be performed by certified personnel only.

This process is used to achieve the thin-film coating as shown in the housing process drawing #212553.

I. PROCEDURE TO CLEAN HOUSINGS PRIOR TO AL/TI DEPOSITION

The R half housing blanks are rinsed with trichloroethane. Next, the quartz housings are rinsed in acetone. After pouring off acetone, the housings are rinsed with deionized water. This is followed by a half hour soak in a Micro (tm) detergent solution. Before removal from the detergent solution, the housings are scrubbed with cotton swabs and are finally rinsed thoroughly with deionized water for approximately five minutes. Housings are then removed from the water and blown dry with filtered, dry nitrogen.

II. PROCEDURE TO DEPOSIT AL/TI THINFILM BILAYER

Thin-film deposition is accomplished in a liquid nitrogen trapped diffusion pumped vacuum system. The evaporation source is an Airco-Temescal STIH 270-6M electron beam gun powered by a Temescal CV-10 power supply. The electron beam gun is a rotating turret source capable of handling six separate source materials. Up to four housings may be mounted in the appropriate metal shadow mask. As viewed from the cavity side of the housing, the housing's jig hole which is both adjacent to and counterclockwise from the housing's small counterbored hole is positioned directly over the alignment hole in the mask to allow correct angular positioning. A pin is used to prevent any subsequent relative motion. Once the housings are installed, the vacuum chamber is pumped to approximately 5 to 8 X 10^-7 torr. Source to substrate distance is normally approximately ten inches. With a shutter shielding the housing(s) the electron beam source is rotated to expose the titanium source and power is turned on and increased to yield a rate of deposition of about 25 angstroms per second. The shutter is opened and approximately 1000 angstroms is deposited on the housings where exposed to the vapor flux. Power to the electron beam gun is shut off when set thickness is reached. The turret is immediately rotated to expose the aluminum source and power is once again turned on to begin heating the aluminum. Once a rate of approximately 100 angstroms per second is reached the shutter is opened and deposition continues until a five micrometer (50,000 angstrom) film is deposited. When power is turned off, the system is valved appropriately and vented with dry nitrogen to atmosphere.

III. PROCEDURE FOR REMOVING Al-Ti FROM ON HOUSING CAVITY

Note: *No fixturing or tooling exists for this procedure. Goggles, vest, exhausting fume hood, and acid gloves are used to protect the operator.*

1. Preheat oven to 90^{o}C;

2. Add 100 ml of H_3PO_4 to 100 ml of DI water.

3. Heat acid solution to 60^{o}C.

4. Apply a small amount of photoresist (1427) to artist's brush, remove excess on clean surface.

5. Apply a thin coating of resist to the parting plane being careful not to get any resist in cavity or on chamfer.

6. Place housing in preheated oven for 30 minutes.

7. Remove a single housing from oven.

8. With pipette immediately add Phosphoric acid/water solution to housing cavity.

9. Wait for Al-Ti bilayer to clear from cavity surface (approximately 1 minute).

10. Rinse part in DI water for 5 minutes.

11. Remove from water and blow dry.

12. Rinse part with acetone to remove resist and then blow dry.

13. Check housings for interference (see next section of this procedure).

14. Dump excess acid in storage vessel

15. Inspect and document in traveler.

IV. PROCEDURE TO CHECK INTERFERENCE BETWEEN PROTECTIVE COATING AND S RELIEF AREA

1. The R and S halves of the housing in question are mated together using a pin gauge for alignment.

2. A low power microscope is used to check for interference between the protective coating and the relief area on the S half.

3. If an interference exists, an attempt should be made to understand its origin so as to prevent its future reoccurrence. Additionally, an interference is unacceptable. The part will have to be stripped and recoated.

4. If no interference is found, a record is made in the traveler indicating successful completion of this process.