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GENERAL INSPECTION OF HOUSINGS

I PROCEDURE

The purpose of this procedure is to describe the equipment, materials, detailed process, and documentation required to inspect the general condition of a quartz housing during its fabrication process.

II EQUIPMENT

- Polariscope with retarding plate
- Microscope, Olympus SZH or equivalent equipped with transmitted light, coaxial and off-axis incident light illumination.
- Nitrogen gun, with 0.2 micron point of use filter
- Holder, (TBD)

III MATERIALS

- Housing Inspection Form
- Isopropanol, squeeze bottle
- Swabs, foam

IV RECORDING

1. Types of defects
   a. Mechanical damage
      - Chipouts
      - Cracks
      - Scratches

2. Contamination
   - Stains
   - Films
   - Particles

3. Strain

4. Regions for inspection
   a. Parting plane
      - Readout surface
      - Contact surface
      - Relief areas

   b. Back plane

   c. Cavity surface
      - Electrodes
      - Support land regions

   d. Machined features
      - Chamfers
      - Spin-up lands
      - Electrode reliefs
      - Electrode connector holes

5. What to record
   - Use coaxial illumination
   - Location and size of largest defect of each type in each region
   - Location and size of next nine (9) largest defects of each type in each region
   - Count or estimate the number of defects l/10th or larger the size of the 10th largest defect

V DETAILED STEPS

1. Visual inspection
   - Blow off loose contamination with nitrogen gun
   - Examine all regions for all defects
   - Use ***"Housing Inspection Form"*** to record observations

2. Inspect for strain
   - Use polariscope with retarding plate
   - Examine for color around machined features, holding with parting plane normal to polariscope axis. Look into both parting plane and back plane.

3. Clean
   - Clean per GP-B S0025

4. Install in fixture
   - This fixture will prevent the parting plane and back plane of housing contacting the microscope during examination while holding the housing steady and normal to the microscope axis.

5. Microspic inspection
   a. Parting plane
      - Start with a magnification of 7.5X, increase magnification as necessary to locate and identify the 10 largest defects.
      - Defects requiring magnifications greater than 200X to locate shall be ignored.

   b. Back plane
      - Use coaxial illumination
      - Start with a magnification of 7.5X, increase magnification as necessary to locate and identify the 10 largest defects.
      - Defects requiring magnifications greater than 20X to locate shall be ignored.

6. Cavity Surface
   - Use transmitted and off-axis incident illumination
   - Start with a magnification of 7.5X, increase magnification as necessary to locate and identify the 10 largest defects.
   - Defects requiring magnifications greater than 65X to locate shall be ignored.

7. Machined Features
   - Use transmitted illumination.
   - Start with a magnification of 7.5X, increase magnification as necessary to locate and identify the 10 largest defects.
   - Defects requiring magnifications greater than 20X to locate shall be ignored.