**Cassette & Foup Leveling**

**Purpose:** Verify integrity of Foup or Cassette

1. Place cassette or Foup on stable surface.
2. Insert ALS to lowest slot with V-notch orientation to the front.
3. Parameters — GONI: 0.2°, relative mode; stability: 0.05°, 5 sec.
5. Remove ALS & insert to next slot above, continue the same sequence to top slot.
6. Open the CSV file with Excel & create a graph of displayed roll & pitch.
7. Verify that Foup or cassette conforms to fab quality tolerance & standards.

**Load Port Leveling**

**Purpose:** Verify proper wafer position before entering tool

1. Set the cassette or Foup on load port.
2. Insert ALS to the middle slot with V-notch oriented to the front.
3. Parameters — GONI: 0.2°, absolute mode; stability: 0.01°, 10 sec.
4. Adjust the load port to set the ALS pitch from 0° to 0.2° (slight backwards tilt).
5. Make the log file, and save the adjusted level value for future reference.

**Robot Vertical Axis Leveling**

**Purpose:** Mechanical robot arm verification

1. Power off robot, or disable robot arm control.
2. Rotate end-effector to CW limit.
3. Place ALS on end-effector with V-notch pointing to center of rotation.
4. Parameters — GONI: 0.05°, relative mode; stability: 0.05°, 10 sec.
6. Log data for every 30° position of the end-effector before the limit.
7. Open the CSV file with Excel & create a graph of motion for analysis.
8. Inconsistencies in arm motion may indicate potential component failure.

**End-effector Leveling**

**Purpose:** Verify proper wafer handling

1. Place an empty Foup at load port.
2. Place ALS into Foup with V-notch orientation to the front.
3. Parameters — GONI: 0.2°, relative mode; stability: 0.01°, 1 sec; auto log: every 2 sec.
4. Make a log file and set the reference plane.
5. Slowly move ALS throughout tool for 5-10 min while recording the data.
6. Open CSV file in Excel & create graph of arm motion for analysis.
7. Readings outside tolerance may indicate excessive wafer vibration, component failure and/or potential wafer damage.

**Lift Pin Leveling**

**Purpose:** Prevent wafer damage & particle contamination

1. Place ALS on lift pins with V-notch oriented toward robot.
2. Parameters — GONI: 0.05°, absolute mode; stability: 0.01°, 1 sec; auto log: every 1 sec.
4. Adjust the lift pins so all are level.
5. Lower lift pins & check levelling in down position (if lift pins can’t be stopped at down position, monitor bubble motion in Level View).
6. Make level adjustments.
7. Execute repeatable a test of lift pin motion to verify level consistency and positioning.

**Stability Check**

**Purpose:** Check for wafer jarring or vibration

1. Cool tool to 20°C to 70°C range.
2. Place ALS into chamber or furnace.
3. Parameters — GONI: 0.05°, relative mode; stability: 0.01°, 1 sec; auto log: every 2 sec.
4. Make a log file and set the reference plane.
5. Slowly move ALS through tool for 5-10 min while recording the data.
6. Open CSV file in Excel & create graph of arm motion for analysis.
7. Readings outside tolerance may indicate excessive wafer vibration, component failure and/or potential wafer damage.

**Vacuum Deflection**

**Purpose:** Verify pedestal levelness under vacuum

1. Place ALS in CVD or PVD chamber.
2. Parameters — GONI: 0.05°, relative mode; stability: 0.01°, 1 sec; auto log: every 1 sec.
4. Pull chamber to vacuum.
5. Create a new log file, set a new reference plane and start auto log again.
6. Vent chamber to atmosphere.
7. Open the two log files in Excel & graph the data for both vacuum & atmosphere.
8. Excessive atmospheres to vacuum inclination changes may indicate a processing problem.

**Level Copy**

**Purpose:** Verify wafer transfer points at same inclination

1. Place ALS on master pedestal to be copied.
2. Parameters — GONI: 0.01°, relative mode; stability: 0.05°, 20 sec.
3. Make new log file, set reference plane and log data.
4. Remove ALS and re-set to slave pedestal.
5. Adjust slave pedestal within tolerance and log data.
6. Inclination variances between wafer transfer points introduce potential wafer damage, mishandling, or particle contamination.

**Active Damping System (ADS) Verification**

**Purpose:** Verify ADS repeatability and verify that ADS returns surface to same position after each test

1. Place ALS on ADS-controlled surface.
2. Take level reading.
3. Shake or jar the ADS surface to simulate movement that is dampened by ADS.
4. After ADS surface and ALS has stabilized take another level reading.
5. Repeat steps 1 to 4 above two to three times recording the ADS reading each time.
6. All repetitions should return to the same level reading. If discrepancies exist then check ADS.

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