

Method to Eliminate Prober Chuck Particles

Particles on prober tool chucks can cause the wafer to be poorly aligned to the probe card and can even cause probe card damage. These particles are typically carried into the tool on the backside of wafers. The normal procedure to remove these particles is to shut down the machine and open it to clean the chuck. This procedure interrupts tool availability, especially if the system is running at high or low temperature.

The Stage Clean™ Chuck Cleaning Wafer (CCW) was developed to remove and trap the loose debris that accumulates on the wafer chuck. The Stage Clean product has a highly cross-linked polymeric material that is mounted on wafers, and the wafer is run polymer-side down through the tool. This technical brief describes how to use it to remove particles from an Accretech* - UF200/A, UF2000, or UF3000/EX system.

1. Prepare the prober for performing a wafer chuck cleaning execution

- “8inch” wafer size set in Device Parameter Settings
- “Notch” as wafer referencing set in Device Parameter Settings



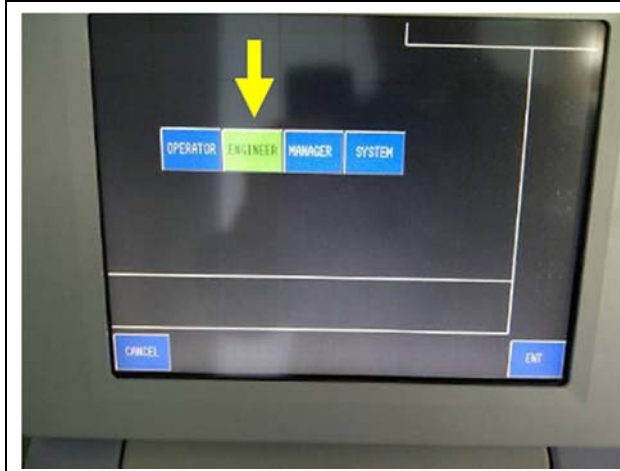
DEVICE PARAMETER SETTINGS
⇒ “Wafer Size”
⇒ “8-inch”



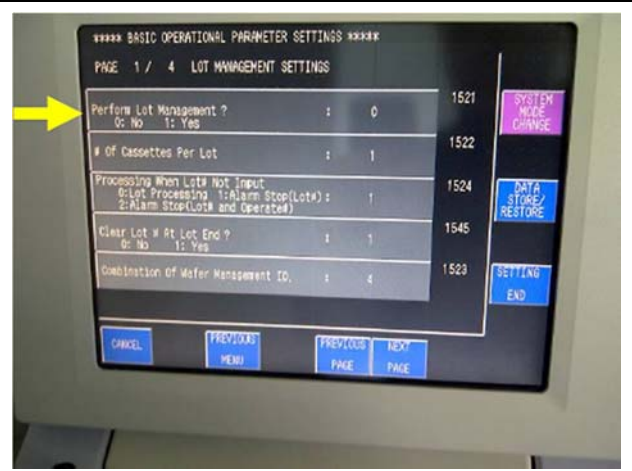
DEVICE PARAMETER SETTINGS
WAFER REFERENCE DIR. SETTINGS
⇒ Flat / Notch
⇒ 1: Notch

- Change to “ENGINEER” level in SYSTEM MODE CHANGE by entering the appropriate password
- “Lot Management Settings” disabled (Prober Mode Settings)
- “Wafer ID reading” disabled (Prober Mode Settings)

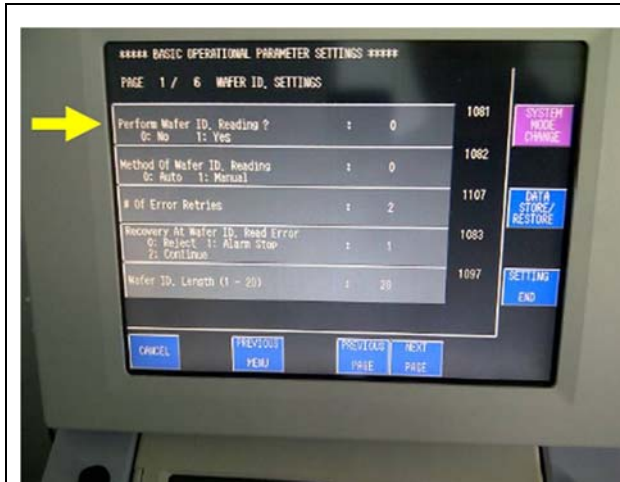
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SYSTEM MODE CHANGE
⇒ "ENGINEER"
⇒ "8-inch"



BASIC OPERATIONAL PARAMETER SETTINGS
LOT MANAGEMENT SETTINGS
⇒ Perform Lot Management?
⇒ 0: No



BASIC OPERATIONAL PARAMETER SETTINGS
WAFER ID. SETTINGS
⇒ Perform Wafer ID. Reading?
⇒ 0: No

If the any of the settings do not appear in the menus, then it is possible that the parameters have been have been masked in PARAMETER MASK UTILITY. Please contact the appropriate equipment service engineer to access these settings, as appropriate.

IMPORTANT:

After the Chuck Cleaning Wafer (CCW) process has been completed and the chuck is debris - free, all of the prober settings should be reset to their original values to ensure a normal process flow for wafer test production.

Once the prober settings have been confirmed, the prober is ready for loading the chuck cleaning wafer to remove particles that may have accumulated on the chuck surface during normal operation.

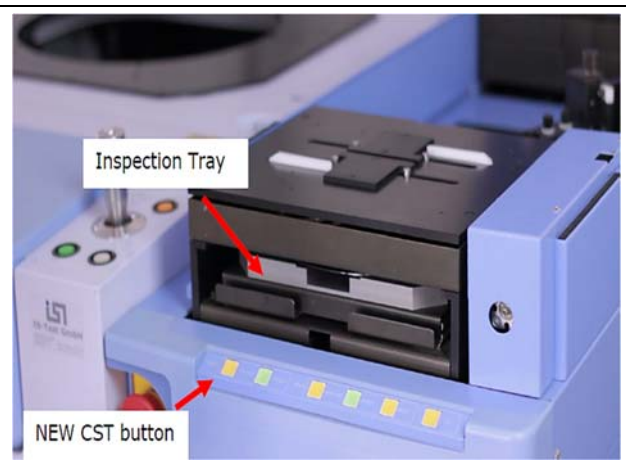
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2. Manual handling of a Chuck Cleaning Wafer (CCW)

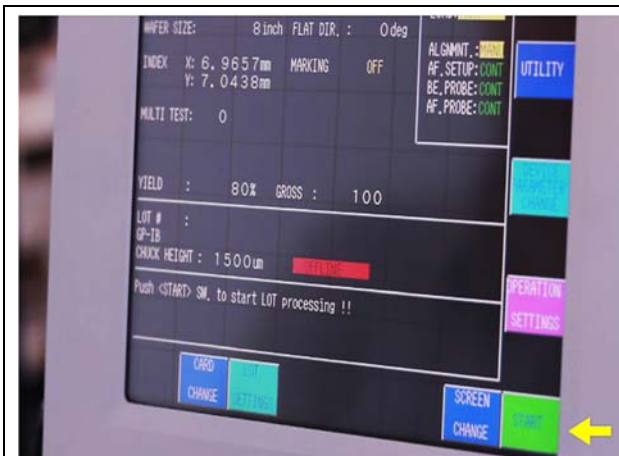
- Please follow this sequence for manual loading via “OPERATION SETTINGS”
 - ALIGNMENT MODE ⇒ MANUAL
 - LOAD / UNLOAD POSITION ⇒ INSPECTION TRAY
- Place the Chuck Cleaning Wafer (CCW) polymer side down into INSPECTION TRAY
- Push NEW CST



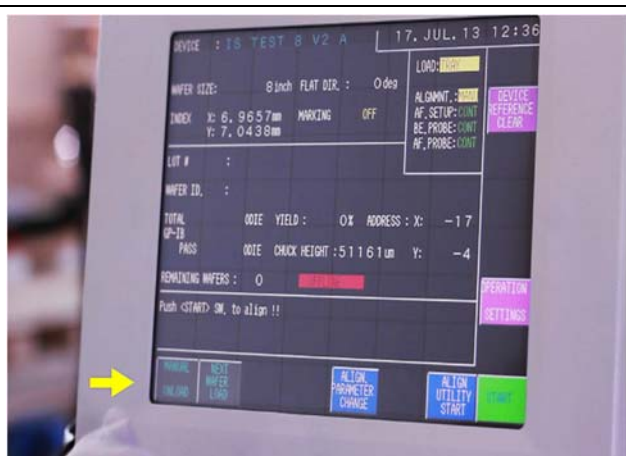
OPERATION SETTINGS
⇒ ALIGNMENT MODE ⇒ MANUAL
⇒ LOAD/UNLOAD POSITION ⇒ INSPECTION TRAY



CCW with polymer down into INSPECTION TRAY
⇒ NEW CST ⇒ Perform Lot Management?
⇒ 0: No



Load Chuck Clean Wafer
⇒ START

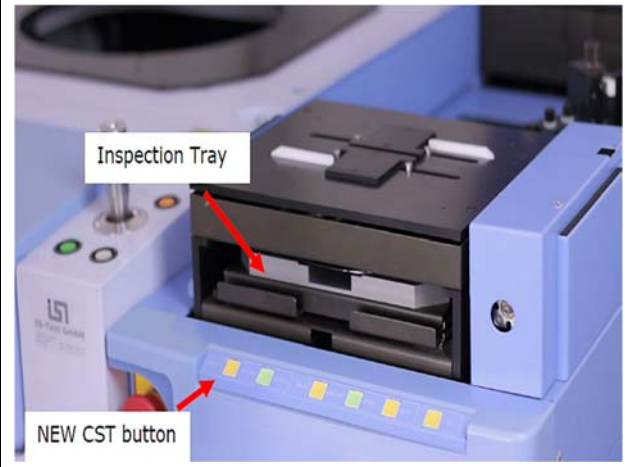
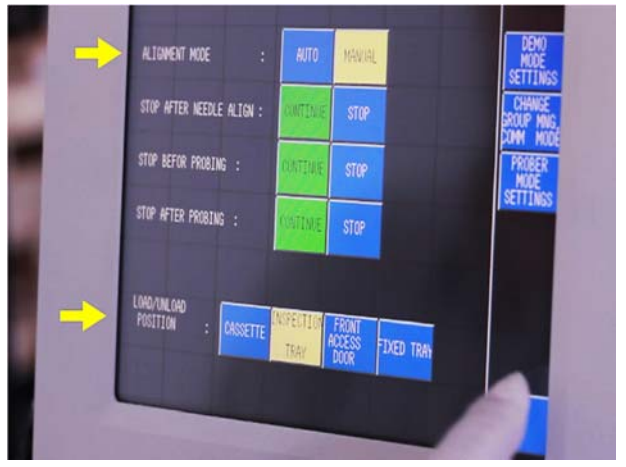


Unload Chuck Clean Wafer
⇒ MANUAL UNLOAD
⇒ MANUAL UNLOAD

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- Remove the Chuck Cleaning Wafer from INSPECTION TRAY
- “Alignment Mode” ⇒ “AUTO”
- “Load/Unload Position” “CASSETTE” (see Fig. 1)

 <p>Inspection Tray</p> <p>NEW CST button</p>	 <p>ALIGNMENT MODE : AUTO MANUAL</p> <p>STOP AFTER NEEDLE ALIGN : CONTINUE STOP</p> <p>STOP BEFORE PROBING : CONTINUE STOP</p> <p>STOP AFTER PROBING : CONTINUE STOP</p> <p>LOAD/UNLOAD POSITION : CASSETTE INSPECTION TRAY FRONT ACCESS DOOR FIXED TRAY</p>
<p>Remove CCW from INSPECTION TRAY</p>	<p>⇒ ALIGNMENT MODE ⇒ AUTO ⇒ LOAD/UNLOAD POSITION ⇒ CASSETTE</p>

- **IMPORTANT:** After the Chuck Cleaning Wafer (CCW) process has been completed and the chuck is debris -free, all of the prober settings should be reset to their original values to ensure a normal process flow for wafer test production.

3. Additional parameters for improvement of CCW handling

The CCW is designed for easy loading and unloading from the wafer chuck of the prober with minimal adjustments to the prober parameter settings. In some instances, settings may need to be adjusted to allow for improved handling of the CCW to maximize the cleaning performance.

IMPORTANT: The following parameters are only accessible after re-booting the prober and by entering the appropriate password for “SYSTEM” level permissions inside SYSTEM MODE CHANGE.

Reduce F axis maximum speed and maximum acceleration for a slower lift up of stage pins

- PROBER CONFIGURATION CHANGE
- X, Y, Z, Theta, F AXIS DATA SETTINGS
- F AXIS MOVEMENT SETTINGS

IMPORTANT: If the values entered are too low, the following error could occur: “F AXIS OUT OF CONTROL”. Please increase the value of the “F Axis Speed” or the “F Axis Acceleration”.

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PROBER CONFIGURATION DATA SETTINGS
 ⇒ PROBER CONFIGURATION CHANGE
 ⇒ X, Y, Z, Theta, F AXIS DATA SETTINGS
 ⇒ F AXIS MOVEMENT SETTINGS
 F Axis Speed Maximum Speed (um/sec)
 F Axis Speed Maximum Acceleration (g)

Increase the delay time before stage pins lift up

The “Delay Time before PIN Up” parameter is only accessible in “Prober Mode Settings” by entering the appropriate password for “ENGINEER” permission level inside SYSTEM MODE CHANGE.

- PROBER MODE SETTINGS
- WAFER LOAD SETTINGS



BASIC OPERATIONAL PARAMETER SETTINGS
 ⇒ PROBER MODE SETTINGS
 ⇒ WAFER LOAD SETTINGS
 Increase Delay Time before PIN Up (sec)

4. Basic Troubleshooting of CCW Handling:

- Wafer Load Error / Unload Error

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1. Observe the CCW behavior during release from the loader arms, sub-wafer Chuck, and main chuck carefully to assess the handling of the wafer during the loading process.
 2. If the adhesion force of the polymer is too high, this could cause “popping-up” of the wafer when it releases from the chuck surface as the eject pins are applied.
 - a. This could lead to handling errors as the wafer is out of the expected position when this happens.
 - b. If positioning errors are observed, stop testing of the Chamber Cleaning Wafer
 3. Contact ITS for recommendation for safe wafer handling inside the wafer probe system.
- F Axis Out Of Control
 1. This error could occur immediately after after changing parameters for F axis maximum speed and maximum acceleration
 2. Revert to the original values in the settings to clear this error.
 - If the wafer handling issues cannot be resolved, please contact the local equipment engineer or field service engineer about handling adjustments on the prober.

Contact **SiSTEM Technology** at +44 (0)1327 362 844, or via email at sales@sistemtechnology.com, to discuss your specific cleaning application and requirements.

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