1 SCOPE

The purpose of this document is to detail the use of the Westech 372 Wafer Polisher. All users are expected to have read and understood this document. It is not a substitute for in person training on the tool and is not sufficient to qualify a user on the system. Failure to follow guidelines in this document may result in loss of privileges.

2 REFERENCE DOCUMENTS

- Material Safety Data Sheet Bayer Levasil Oxide Slurry
- Westech 372 System Manual
- Ipec372proc.doc (flow chart of operation)

3 DEFINITIONS

Platen- The large turn table that the polishing pad mounts to
Slurry- The chemical solution used to polish wafers

4 TOOLS AND MATERIALS

4.1 General Description

4.1.1 The Westech 372 polisher is a 4"or 6" Chemical Mechanical Planarization tool. This tool is automated and has the capability of polishing cassettes full of wafers in one run. This tool has been isolated to do dielectrics without the contamination of metal.
SAFETY PRECAUTIONS

In the event of an emergency such as clothing or hair caught in tool, press a red EMO button. There are 5 EMO buttons, one on every face, and one on the slurry pump control. The one on the slurry pump is only to be used in an absolute emergency and only kills the slurry pump mechanism.

The Westech 372 polisher uses various non-neutral pH materials in the polishing process. Operators should read the Material Safety Data Sheets (MSDS) for these materials and be familiar with hazards and safety controls to prevent an accident before using the system. The materials are locally contained to prevent any personal harm from occurring during operation. If a slurry leak is detected, an SMFL staff member should be contacted.
During operations, tables and carriers rotate up to 500 RPM, and robot moves upon power up. Main operation area should be covered during operation with provided plexi-glass shield. DO NOT operate without hair net and shield in place.

6 INSTRUCTIONS

6.1 Startup Procedure:

6.1.1 Pre-startup

6.1.1.1 DANGER: Do not operate this tool unless you are qualified and never operate it alone.

6.1.1.2 Ensure all covers are closed before proceeding.
6.1.1.3 If there is a pink tag on the tool, do not operate it.
6.1.1.4 CAUTION: Open air, N2, and water valves slowly to prevent sudden surges of the robot or ruptured lines.
6.1.1.5 Ensure the pads and slurry for your process are in compliance with the schedule to prevent cross contamination and wasted pads and wafers.
6.1.1.6 Ensure the red light on the de-ionized water is not on and the green light is on. Contact the equipment engineer for assistance.

6.1.1.7 Never leave the tool running unattended.
6.1.1.8 Card swipe in.

6.1.2 Startup
6.1.2.1 Slowly turn on air, city water, and N2. Slowly turn on compressed air, cold city water, and N2. Deionized water should be left on whenever a pad is on the platen to prevent drying slurry from ruining the pad. An automatic drip system has been added to the tool to do this.
6.1.2.2 On the front panel, turn power on.
6.1.2.3 Press enter access code.
6.1.2.4 Using number keys, type 333 and press enter.
6.1.2.5 Look around the machine and make sure that nothing is in the polish robot path.
6.1.2.6 Press INITIALIZE, and wait for the machine to finish the initialize routine.
6.1.2.7 Press MASTER MENU to go to main screen.

6.2 Load Recipes:
6.2.1 Press SETUP DATA storage to load recipe.
6.2.2 Press LIST RECIPE to show all recipes.
6.2.3 Select the recipe using the file pointer arrows or page up or page down to select recipe.
6.2.4 Press load recipe and wait for RD:Recipe XX to appear.
6.3  Edit/Create Recipe

6.3.1  Select SETUP PANEL.
6.3.2  Select PRIMARY or FIRST STEP.
6.3.3  Select PHASE # to be modified.
6.3.4  By selecting phase, you start the minute timer. Use number keys to enter desired minutes.
6.3.5  Press phase button again to move to seconds. Use number keys to enter the desired seconds.
6.3.6  Select PHASE again to select flow source.
6.3.7  Select PHASE again to select flow rate using number keys.
6.3.8  Select PHASE again to select end point. (Note: Leave this set to timer.)
6.3.9  Select PHASE again to select control mode. (Note: When timer is selected, this function is not used.)
6.3.10 Select PHASE again to select temperature. Using the number keys, enter the value.
6.3.11 Select PHASE again to select polish pressure. Using the number keys, enter the pressure value.
6.3.12 Select PHASE again to select carrier RPM. Using the number keys enter the RPM value.
6.3.13 Repeat for each phase you need to modify for new recipe.
       6.3.13.1 CAUTION: Before changing the end point or polish position, contact the equipment technician.
6.3.14 Select MASTER MENU.
6.3.15 Select SET UP DATA STORAGE.
6.3.16 Select STORE RECIPE.
6.3.17 Select the letters and numbers for the recipe name in accordance with the name legend. (If you are modifying an existing recipe, only change the date in the recipe name.)
6.3.18 Select STORE RECIPE.
6.3.19 Select ADD FILE.
6.4 Manual Operation:

6.4.1 Preoperational checks
6.4.1.1 Prepare slurry and place the slurry so the pick up tube is at the bottom of the container.
6.4.1.2 The filter and pads must be for the slurry you are using. Check the schedule or contact the equipment engineer if you aren’t sure what you should have.
6.4.1.3 Open both side covers and use the DI spray to wet the primary and final polish pads thoroughly.

6.4.1.4 Depressurize the charge can by turning the regulator all the way counter clockwise and fill to 1" below the top with deionized water. Close cover and charge can to 4 psi by turning the regulator clockwise while watching the pressure gage.
6.4.2 Operation

6.4.2.1 Press operation panel.
   6.4.2.1.1 CAUTION: Make sure front cover is down.

6.4.2.2 Press MANUAL LOAD/UNLOAD and wait for the polish head to come to the manual load position.

6.4.2.3 Open the front cover and wet the carrier with DI water.

6.4.2.4 Wet the wafer with DI water and place it on the carrier with the device side down. (Operator should be wearing gloves before handling wafers.)

6.4.2.5 Close the front cover and press ALARM OFF.

6.4.2.6 Press WAFER STATUS.

6.4.2.7 Under TOGGLE WAFER STATUS, press ARM and wafer present should show next to polish. (Arm in non-cassette positions)

6.4.2.8 Press OPERATION PANEL at the bottom of the screen.

6.4.2.9 Press PRIMARY POLISH CYCLE. Running should appear and the robot should turn to the primary polish pad.

6.4.2.9.1 After oscillation begins turn on the down force valve (yellow handle) on the control panel on the front of the tool. Turn backside pressure on (black handle). The handle points to the function selected.
6.4.2.9.2 Adjust the down force regulator to the desired pressure for your process (See picture below).

6.4.2.9.3 When the primary polish has approximately 10 seconds left turn the 3 way valve (black handle) back to suction and shut off the valve (yellow handle) for down force.

NOTE: Failure to return to suction before the end of the polish will leave your wafer on the platen and you will have to open the side cover and retrieve your wafer manually. Failure to back off the down force to zero can cause the arm to remain in contact with the platen.

6.4.2.10 At the completion of the primary polish cycle, the polish arm should rise and the primary platen should stop. If the platen continues to turn after the run is complete and you don’t intend to do a final polish step press ABORT CYCLE.

6.4.2.11 If your recipe requires a final polish step (OPTIONAL) press FINAL POLISH. Since final polish doesn’t oscillate repeat steps 6.4.2.9.1 and 6.4.2.9.2. as soon as the polish carrier is on the final platen.

6.4.2.12 At the completion of the final polish cycle, the polish arm should rise and the final polish platen and primary platen should stop. If the platens continue to turn after the run is complete press ABORT CYCLE.

6.4.2.13 Press MANUAL LOAD/UNLOAD. The polish arm should turn to the load/unload position.

6.4.2.14 Raise the front cover and place your gloved hand beneath the wafer carrier. Press and hold MANUAL LOAD/UNLOAD to release the wafer.
6.5 Post Operation Procedure:

6.5.1 Wafer Handling
   6.5.1.1 All wafers must be kept immersed in DI water and surfactant until final
          clean is complete.
   6.5.1.2 Perform final clean on wafers.

6.5.2 Equipment Handling
   6.5.2.1 Remove the slurry container and replace it with DI water.
   6.5.2.2 Flush the pumps and slurry system by running DI water through it.
   6.5.2.3 On the main menu select Fluid/Spindle test.
   6.5.2.4 Select primary Fluid/Spindle test.
   6.5.2.5 Select FLUID SOURCE and press ALT until pump 1 is displayed.
   6.5.2.6 Press FLOW RATE: Using the number keys, enter 1000 ml/min and press
          ENTER.
   6.5.2.7 Select FLOW TEST on and run for 3 minutes. Press FLOW TEST again to
          turn it off.
   6.5.2.8 Using the manual hose and nozzle, rinse the primary platten to remove all
          loose slurry.
   6.5.2.9 Condition the Primary pad (Procedure to follow)
   6.5.2.10 Rinse off all surfaces and platens. Close all covers and turn off the power
            switch, city water, air, and N2. Leave the deionized water on for the
            automatic drip system to preserve the pad.
   6.5.2.11 Card swipe out.
## REVISION RECORD

<table>
<thead>
<tr>
<th>Summary of Changes</th>
<th>Originator</th>
<th>Rev/Date</th>
</tr>
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<tbody>
<tr>
<td>Original Issue</td>
<td>Prevost</td>
<td>A 06/05/02</td>
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<tr>
<td>Added backside pressure operation and definitions. Corrected wafer size information. Added card swipe.</td>
<td>Tolleson</td>
<td>B 04/18/06</td>
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<tr>
<td>Added down force and backside pressure control valves on the front of the tool. Added steps for FINAL POLISH option.</td>
<td>Tolleson</td>
<td>C 08/07/07</td>
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