Allied Multiprep System

Before using the **Multiprep system** check the **log-in book** to make sure there is no trouble with the instrument as noted by the previous user.

1. Choose the abrasive/polishing media

Select the proper 8 inch diameter abrasive to use on you sample. (this will vary depending on the sample) A wide variety of polishing and grinding surfaces can be used. Abrasive papers are identified by a number on the reverse side. Smaller numbers indicate a larger grit and should be used first with additional larger numbers should be used until a polishing cloth can be used. (start with 200, then 400 , then 600, ect.)

2. Install the Platen

Remove the protective plastic cover and insert the Platen on the spindle. Note: On the platen base, there is a letter "A" stamped (circled below in photograph). This is used as a reference when placing platens on the machine as it relates to run-out. The platen included with the system has an "A" stamped on the underside that indicates where it should be aligned to the platen base. This is a precision polishing machine and care must be taken to ensure performance. **DO NOT DROP** the platen onto the platen base. Repeated abuse will affect the precision. Keep the surfaces between the platen and platen base clean and dry so the platen run-out remains within specification. Excessive water and polishing suspension buildup will adversely affect run-out.



3. Install abrasive

Place a film of water on the platen surface and the underside of the 8 inch paper. Surface tension should hold the paper to the platen.

4. Vertical Adjustment

The MultiPrep[™] is designed to accommodate samples of variable thickness, and has two methods of vertical adjustment.

Method A is with the vertical adjustment knob (Figure A).

Method B is with the spindle riser (Figures B & C).

Method A: Vertical Adjustment Knob.

The vertical adjustment knob is used to control the vertical position of the sample as defined by the yoke/arm assembly. It is also used to establish the downward travel stopping point for the sample, which occurs when the spindle pulley makes contact with the arm. The readout on the scale around the knob is in 2-micron increments. When rotated clockwise, the arm travels upward. When rotated counterclockwise, the arm travels downward.



Figure A

Method B: Spindle Riser

The spindle riser (Figure B), located on the left side of the arm, is used to raise the spindle/sample without changing the vertical position of the arm. It will be used when it is necessary to replace platens, abrasives or cloths, or for sample inspection. To use, rotate the knob toward the front of the arm until the flat spot on the plastic fin is in full contact with the bottom of the spindle pulley (Figure C). At this point, the sample can be removed for inspection (Figure D) and/or the arm can be swung away to allow platen/abrasive changes. When completed, lower the sample with the spindle riser to continue grinding/polishing. This process returns the sample to its original vertical position, since no adjustments were made to the vertical adjustment knob.



Figure B



Figure C

Note: When replacing platens/abrasives having different thicknesses, a change may be noticed on the digital dial indicator readout. Use the

vertical adjustment knob to reestablish the previous setting if necessary.

5. Fixture Attachment

All fixtures are mounted to the bottom of the angle adjustment plate of the microhub assembly attached at the end/bottom of the spindle. Each fixture has a common U-shaped cutout. The flat edge of the fixture is referenced against the machined edge (lip) of the angle adjustment plate, which is located behind the cam-lock plunger (Figure D). Note: The spindle should be raised either using the vertical adjustment knob or spindle riser so that the sample and fixture fit without contacting the platen/abrasive.

To attach a fixture, slide it onto the plate until it makes full contact with the edge. Make sure it has engaged the cam-lock plunger. Rotate the cam-lock lever clockwise until tight. Mounting of the sample onto the fixture is usually done with wax, double-sided tape, glue or setscrews as required by the type of sample and desired sample orientation.



Figure D Bottom View of Micro-Hub Assembly

6. Rotation

Full Rotation:

Sample rotation is activated by pressing the "Full" button located above the connected "Rotation" keys in the "MultiPrep Controls" box of the TechPrepTM control panel. The rotation speed is variable with (8) settings. To program the speed, press the "Full" key once and then press it again and hold it until the LED turns orange and a double beep is heard. Release the key and select the desired speed using the up/down arrows. In the timer window, the number at the right indicates the current speed setting. Once that speed is selected, press the "Full" key again and the LED turn green. The selected speed will remain the default speed until reprogrammed.

7. Limit Rotation:

Limit rotation allows the sample to be rotated in an alternating direction between two points. At the top of the rotation motor pulley, where the O-ring is connected from the motor to the spindle, there is a knurled screw. When loosened, this screw allows adjustment of the two magnets used to define the range travel. The sensor pickup is located on the left side of the arm where the oscillator link/bar is attached.



8. Oscillation

1. Range: To set the range of the sweep, loosen the horizontally oriented thumbscrew that is located on the oscillation motor (see "range" thumb screw, on Figure E).

Slide the dovetail bar so the drive pin moves closer to or farther from the center of the hub. Moving the pin closer to the center will provide a smaller sweep (range), and moving it farther from the center will create a larger sweep.

2. Position: The oscillation position is the area over the platen where the sample will sweep and is defined by the drive linkage length. Set this position after setting the range. The linkage consists of a drive bar that is engaged into a hollow cylinder. It is adjusted by loosening the thumbscrew that is vertically oriented on the cylinder (see "position" thumbscrew on Figure E). Adjusting the engagement depth of the bar will position the sample over the desired area of the abrasive. Less engagement will position the sample toward the outer edge of the platen/abrasive, and more engagement will position it toward the center of the platen/abrasive. After adjustments are made, activate the oscillator and make sure the position selection does not cause the sample to extend over the edge of the platen.

3. Speed: The "OSC" key located on the TechPrepTM control panel in the box labeled "MultiPrep Controls" is a toggle key. Every time the

key is pressed, it either activates or deactivates the power for the oscillator motor. When the motor is activated, the LED is green. The speed for the oscillator is adjustable with 6 speed settings and is programmed using the TechPrepTM keypad. To program the oscillator speed, press the "OSC" key, activating the oscillator motor, then press the "OSC" key again and hold it until the LED turns orange and a double beep is heard. Release the key and select the desired speed using the up/down arrows. Once that speed is selected, press the "OSC" key again and the LED will turn green. The selected speed will remain as the default speed until reprogrammed.

9. Sample Load

Total spindle load is approximately 500grams. The total load with fixture will change based on the fixture that is used. For certain polishing applications (i.e., fragile specimens, TEM thinning) it may be desirable to reduce the amount of load on the sample. The load adjustment feature (right) allows load reduction from 0-600 grams in 100- gram increments. Adjust the sample load by turning the knurled screw (load adjustment screw) until the indicator moves to the desired setting on the scale.



10. Control Panel, On/Off

This button activates and deactivates the control panel. Platen Controls

The platen controls include buttons for: RPM, Start/Run, Stop/Pause and platen direction (clockwise and counterclockwise). Arrows mark each platen direction button; an LED, when illuminated, indicates which direction is selected. If during operation the button for the direction not selected is pressed, all functions are paused. The new direction is activated, but the machine will remain stopped until the platen is re-activated by pressing the "run" button. The Stop/Pause button stops the platen, coolant and, if activated, all MultiPrepTM controls.

Coolant

The coolant button activates and deactivates the water solenoid. When a water supply line is installed, the solenoid allows water to pass through when activated.

Keypad

The keypad is used for platen RPM selection, timer entry and speed selection for the oscillator and rotation functions of the MultiPrepTM. Any value entered on the keypad defaults to the RPM value. When selecting platen speed, there are two methods: 1) using the arrow buttons to increase (up arrow) or decrease (down arrow) the speed or 2) pressing the number buttons AND pressing enter. Note: The "enter" button must be pressed following number entry for the RPM or timer function to activate the value.

Timer

Located in the "MultiPrep Controls" box on the TechPrepTM panel is the timer. In its default mode it may be used as a counter (to characterize polishing methods) or it can be set for unattended operation.

The timer can be set before or after platen rotation is activated. If started during operation, it will begin countdown after the "enter" button is pressed. If it is set before operation, countdown will begin when the "run" button is pressed and the platen is activated. Should the machine be stopped during operation, the timer stops counting and resumes when the "run" button is pressed again. Set the timer by pressing the "timer" button (the LED will illuminate). Enter the desired time using the keypad and press "enter". If during entry a mistake is made, press the "c" (clear) button and re-enter the correct time followed by pressing "enter".

11. Remove the sample

Raise the Spindle , turn the Cam-Lock lever and remove the sample. Remove the abrasive paper from the platen. Clean and dry the Spindle surface and the platen.

Sign-out in the log book and indicate any trouble you may have experienced.

Emergency Information:

Medical Emergencies: Contact 911 and Public Safety (609) 258-1000 Room / facility emergencies: Contact Public Safety (609) 258-1000 Issues related to the instrument:

- 1. Contact IAC Staff.
- 2. If unsure, leave system as is.

3. Try to power down the system.

Audible/Siren Emergency Alerts:

Follow previous steps 2 & 3 and leave the building.

Emergency Contact Information:

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