

Wyko/Veeco NT9100 Optical Profiler

Standard Operating Procedure

STARTING THE OPTICAL PROFILER

- Make sure sample stage is **EMPTY**
- **LOG IN** to the instrument
- Launch “Vision” software from desktop shortcut
 - If the software asks you to verify an empty stage, do so and click OK. The optics turret will then rotate back and forth for self-check.

SETTING UP INSTRUMENT FOR USE

- Open **MEASUREMENT OPTIONS** from the tool bar
- Select **VSI** or **PSI** as measurement type, as described above. VSI is good to 2nm vertical resolution; PSI has a more narrow range but is good to 0.2nm resolution.
- Choose the **10X** objective lens, and the **0.55X** FOV settings.
 - This gives the largest field of view for initial sample location and rough focus.
- Click OK to close Measurement Options.

LOADING SAMPLE

- Make sure lenses and sample chuck are more than two inches apart.
- Load a **CLEAN** and **DRY** sample on to the sample chuck.
 - The vacuum chuck uses a porous stone than can be easily damaged by dirty or wet samples.
 - The vacuum chuck can be actuated with the manual vacuum valve.

SETTING UP A MEASUREMENT

- Open **INTENSITY** from the tool bar
 - You should see a flashing light from the objective, projected on the sample chuck. Use the XY stage to move your sample under the flashing light.
- Open **Z-AXIS** control from the Intensity window
 - Next, you will be lowering the objective towards the sample. **Watch the lens and the sample, not the computer screen!**
 - Move the lens close (~5mm) to the sample **VERY CAREFULLY**.
 - Now, watch the computer screen and locate your sample by **reversing the lens travel direction** to move the lens **UP** and **AWAY** from the stage. This way, you will not crash the lens into the stage while observing the image on the computer screen.

- Once your sample comes into view, choose a very slow Z-AXIS speed and focus until you see fringes.
- Open **MEASUREMENT OPTIONS** again from the tool bar. Choose **VSI** or **PSI** for your measurement type.
 - Choose your objective, but make sure that **NOTHING IS IN THE WAY** of the sample if switching to 50X. This includes sample holders, tall sample parts, etc.
 - Choose your FOV objective multiplier.
 - Go to **VSI Options** or **PSI Options** tab as appropriate.
 - **VSI Options:**
 - Back Scan: Leave at default 5μm
 - Scan Length: Approximate desired depth of scan. It's better to overshoot by 20% than to undershoot.
 - Modulation Threshold: Leave at default 5%.
 - Everything else should be default.
 - **PSI Options:**
 - Modulation Threshold: Leave at default 5%.
 - Everything else should be default.
 - Click OK to exit Measurement Options.
- Return to the **INTENSITY** window.
 - Use the Z-axis to get fine focus on sample; fringes will appear.
 - Use two manual tilt knobs to align fringes perpendicular to step or primary feature.
 - Remove tilt until only you have only a few fringes (VSI) or one fringe (PSI) visible.

TAKING A MEASUREMENT

- Click **NEW MEASUREMENT** from toolbar.
 - Measurement will proceed.
 - Adjust scan length for optimal image and rerun New Measurement.
 - Right click on image and choose Analysis Options for different tilt compensation. Modal Tilt will usually be the best option.

DATA ANALYSIS

- Use any of the numerous options to analyze and view your data. Save data and images as appropriate.

CLEANING UP

- Use the **Z-AXIS** control to move objective lens **UP** and **AWAY** from sample, again **while watching the sample, not the computer screen**. Move at least two inches from sample.
- Remove sample.
- **CLOSE** all open windows and exit Vision software and log of the tool.