

**Filmetrics F40 UV Thin Film Measurement System Standard
Operating Procedure**



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1. Startup

- **Turn on light source on the front panel of the F 40 UV by depressing the “light source” button. Please allow 5 minutes of warm-up time.**
- **Start the FILMeasure software on the computer by double clicking the icon on the desktop.**

2. Baseline and Reference Check

- **The F40 UV should be baselined and referenced checked before the start of each run, or after switching to a different type of film to be measured.**

2.1. Baseline Settings

2.1.1. Measure Tab

- **Select the “Measure Tab” at the top of the screen**

2.1.2. Focus the camera/optics

- **Place the 4” Filmetrics “Focus/Reference” wafer on the measurement stage and ensure that the “Focus” field is underneath the objective lens.**
- **Select the “Live Video” Tab in the “Measure” menu. In the “Live Video” menu, change the focus slider to the highest magnification.**
- **Adjust the camera focus with the z-axis micrometer on the measurement stage.**

2.2. Measurement of the Standard SiO₂ sample

2.2.1. Step 1

- On the “Focus/Reference” wafer, move the area designated as “SiO₂” underneath the objective lens.
- Focus on the area using the “Live Video” focusing procedure as outlined in 2.1.2 if necessary.
- Click on the “Baseline” radio button. A “Sample Reflectance” dialog box will appear.
- Click the “Take Sample Reflectance” radio button in the dialog box.

2.2.2. Step 2

- The dialog box for Step 2 will open when Step 1 is complete.
- The “Reference” field on the “Focus/Reference” wafer should be placed under the objective lens.
- Focus on the area using the “Live Video” focusing procedure as outlined in 2.1.2 if necessary.
- Choose “Si” from the pull-down menu of the “Reflectance Standard” box.
- Click the “Take Reflectance Standard” button

2.2.3. Step 3

- The dialog box for Step 3 will open when Step 2 is complete.
- Place the 45°-angled reflectance substrate underneath the objective lens.
- Click the “Take Background” button.
- After the background measurement is complete, click “Finish”.

2.2.4. Measurement

- On the “Focus/Reference” wafer, move the area designated as “SiO₂” underneath the objective lens.
- Click the down arrow on the box above the “Edit Recipe” button.
- Select the “SiO₂ on Si” from the dialog box, and click “OK”.
- Click “Measure” to measure the thickness of the standard, which should be 10080 Å.
- The measurement should be within ± 42 Å of the expected thickness.
- Remove the “Focus/Reference” wafer.

3. Measurement on Sample-Note: If the measurement substrate is blank Si, skip to 3.3, and go to 3.4 for measurement

3.1. Step 1

- Click “Baseline”. The “Take Sample Reflectance” Dialog Box Appears.
- Place the sample beneath the objective lens.
- Focus on the area using the “Live Video” focusing procedure as outlined in 2.1.2 if necessary.
- Click the “Take Sample Reflectance” button.

3.2. Step 2

- The dialog box for Step 2 opens when Step 1 is complete
- Place the substrate underneath the objective lens

- Focus on the “reference” field using the “Live Video” focusing procedure as outlined in 2.1.2 if necessary.
- Choose the substrate material from the pull down menu of the “Reflectance Standard” box.
- Click the “Take Reflectance Standard” button.

3.3. Step 3

- The dialog box for Step 3 opens when Step 2 is complete
- Place the 45° angled reflectance substrate underneath the objective lens.
- Click the “Take Background” button.
- Click “Finish” when done.

3.4. Creating/Editing Measurement Recipes

- Select the desired recipe from the pull-down menu above the “Edit Recipe” button and click “OK”.
- Click “Edit Recipe” to open the “Edit Recipe” dialog box.
- Click “Film Stack” to add, remove, or change the film types in the stack to be measured.
- When edits are finished, click “Apply” then “OK” to apply changes temporarily.
- To save an edited recipe, click “Apply” then “Save Recipe as a Different Filename” (disk with pencil icon), change the filename, then click “OK”.

3.5. Measuring your Sample and Reviewing the Data

- Place sample beneath the objective lens.
- Use the “Live Video” focusing procedure as outlined in 2.1.2 if necessary.

- **Select the desired measurement recipe, edit and/or “Save As” as desired.**
- **Use the live feed and the x- and y- micrometers to locate the area of interest.**
 - **Use the “Center” tab to move the spot measurement location to the center of the live video display.**
 - **Use “Settings” to adjust the spot size for measuring.**
 - **Use “Zoom” to locate smaller areas/features to be measured.**
 - **Click “Measure”. The thickness measurement results should be located in the lower right-hand side of the screen.**

4. Leaving the tool in an “Idle” state

- **Turn off light source only. Do not close FILMeasure software or turn off measurement computer or system main power.**

5. Appendix