# Gaertner Ellipsometer User Instructions

# For the Micro-Electronics Laboratory

# At

# University of Notre Dame

# Department of Electrical Engineering

**Operation:**

**Use Figures #1 - #5 during this procedure.**
**Gaertner Modeling program works very closely to this as well.**
**2nd mode of operation is the 2Angle mode which is very similar as well.**

1. Turn the "Power on/off Keyswitch" until the "Power" light on the front illuminates.
2. Start the "GEMP" (Gartner Ellipsometer Measurement Program) program on the computer.
3. Turn over the table and remove the foam sheet.
4. Pull to open the "Shutter".
5. Set sample wafer on top of table.
6. Looking thru eyepiece adjust the two "Tilt knobs" on the bottom of the table until the "+" and the "X" are overlapping. See Figures # 3 and #4 on Page # 4.
7. In the "GEMP" program:
    a. Click on the "Ellipsometer" menu.
    b. Click on the "Measurement and Calculation" option.
    c. Load or create a setup.
        i. "Phi" is "Angle of Incidence".
        ii. Enter each layers "Thickness", "N", and "K". Chart is listed in Appendix A.
        iii. Enter Substrate information.
        iv. Choose a calculation mode.
        v. Save setup or perform measurement.
    d. Depress the button "Table Height Adjustment".
8. Adjust the black "Table Height Knob" on the bottom of the table until you reach the maximum power available.
    a. When 10 is reached the display wraps back down to 5 to allow for more adjustment.
    b. Small Bar on the right of the diagram shows the Max Power you have reached therefore making it easy to see when you have maximized the power.
    c. Read Results.
9. Remove your sample.
10. Repeat steps #5 thru #9 for as many samples as you have.
11. Close the "GEMP" program.
12. Push to close the "Shutter".
13. Turn off the "Power on/off Keyswitch".
14. Place the table upside down on the foam piece.

**To change Angle of Incidence:**

1. Loosen black "lock screw".
2. While holding the arm of the side you are using, Pull out the "release" knob and change the Angle of incidence of the arm.
3. After setting the new Angle of Incidence tighten the black "Lock Screw".
4. Repeat steps 2 and 3 for the other arm. Both arms should read the same angle.

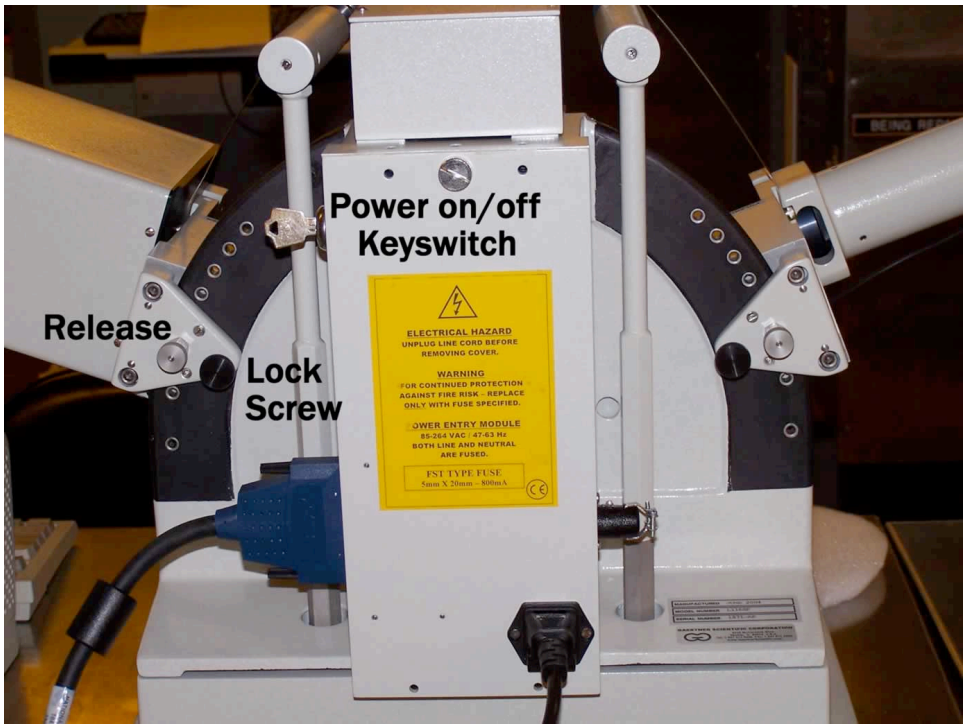


**Figure #1: View of rear of machine.**

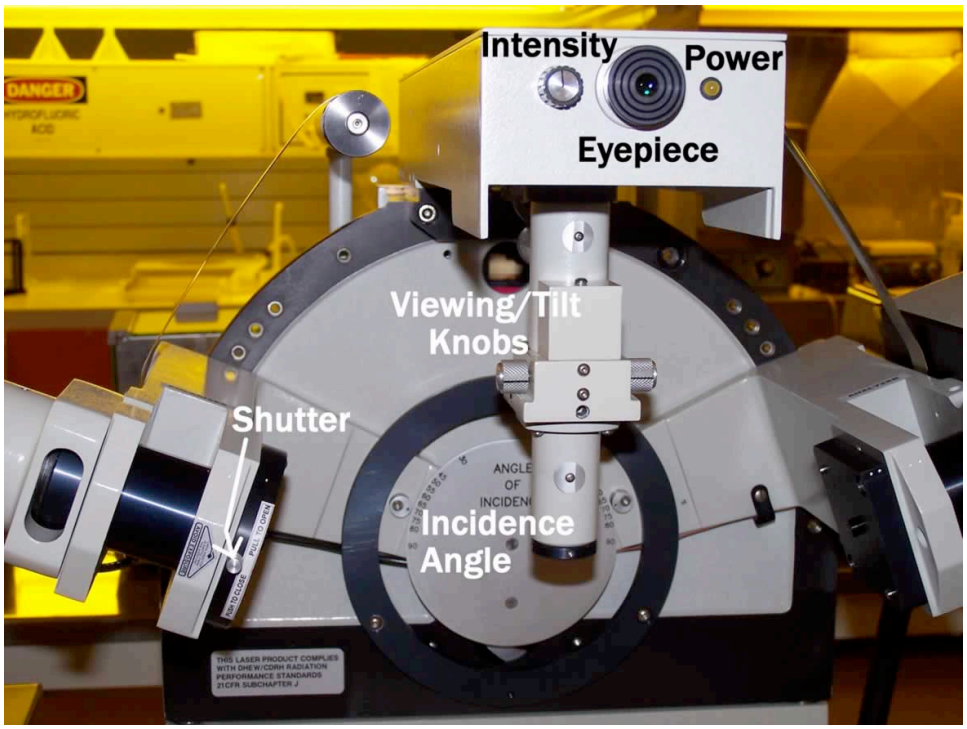


**Figure #2: View of front of the machine.**

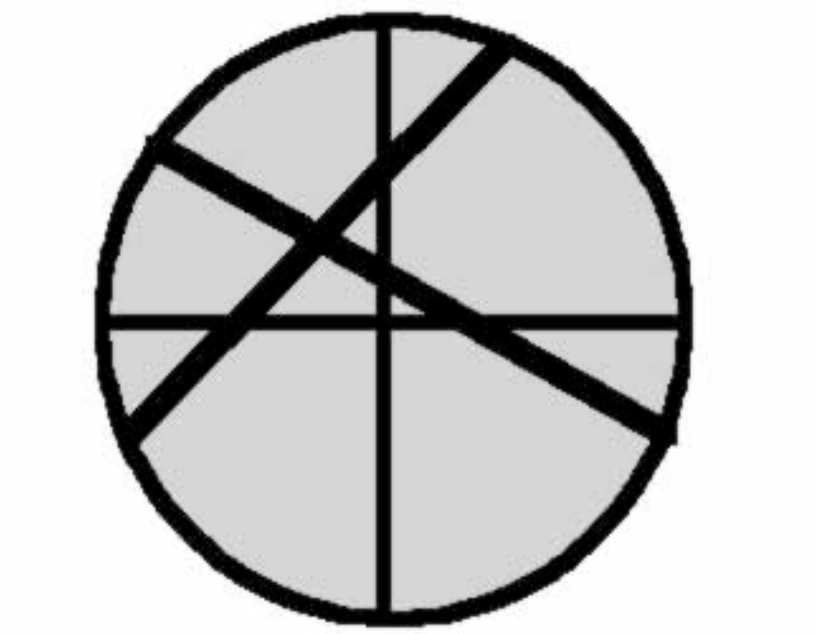

**Figure #3: Looking thru view port before table is aligned.**

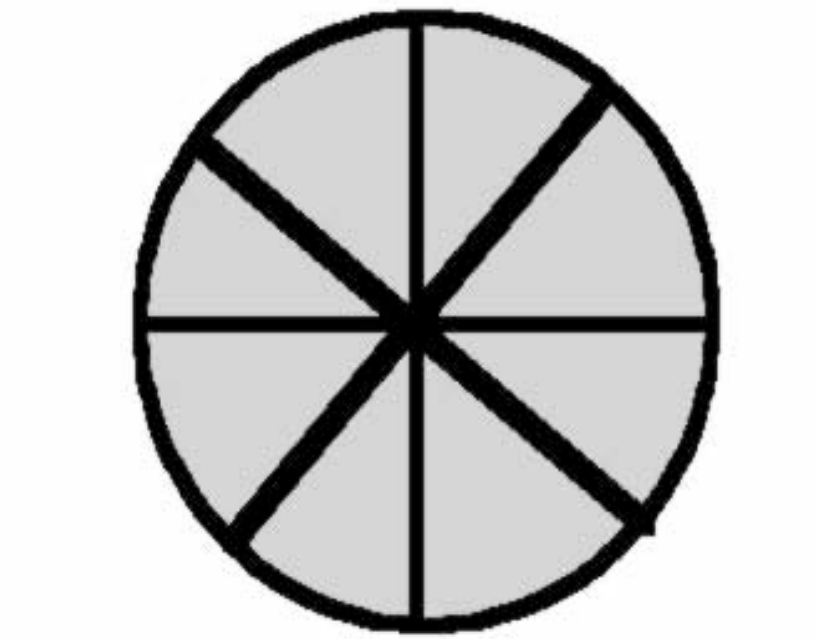

**Figure #4: Looking thru the view port onto an aligned table.**

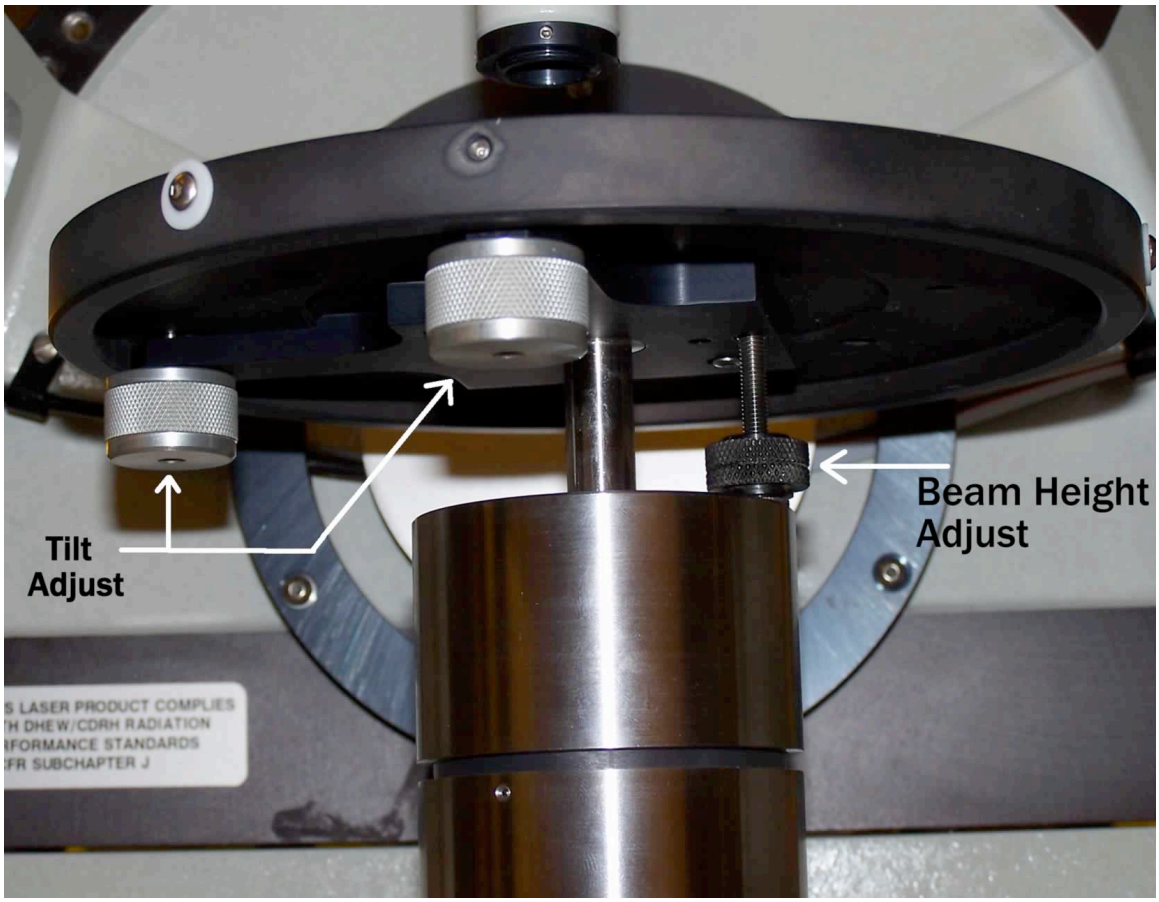


**Figure #5: Bottom of table.**

# Appendix A:

## Ellipsometry Constants