

# ZEISS AXIOSKOP OPTICAL MICROSCOPE SOP

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## PRECAUTIONS AND NOTES

1. Raise the specimen stage slowly and carefully in order to avoid contact between the objective and the wafer.
2. Microscope magnification of 50, 100, 200, 500, and 1000 are available. Microscope magnification is equal to eyepiece magnification (10x) times objective magnification (5x, 10x, 20x, 50x, or 100x).
3. Change the magnification gradually in order to prevent the objective hitting the sample. (i.e. From 50 to 100 instead of 50 to 1000) Always start at 50 and increase gradually.
4. Never place a wet sample on the stage or try to image a sample that is wet or contains a strong acid, solvent or base. This may damage the objectives.
5. Never clean objectives yourself. Tell MNTC staff if this is needed.
6. If the eyepieces need to be cleaned, use Kodak lens cleaning paper and Edmund Scientific Lens Luster Cleaning Fluid. Then blow dry gently with clean nitrogen.

## PROCEDURE

1. Turn on the DC power source for the lamp and adjust needle to around 10 volts.

**NOTE: DO NOT** operate the needle in the red.

2. Load the wafer or device on the specimen stage and move the stage so that the device is positioned under the 5 objective. (The adjustment knobs are under the stage. The upper one is for "x" adjustment, the lower one is for "y" adjustment.)
3. Choose an appropriate objective to get the desired magnification by turning the nosepiece. Start out at low magnification (50) and work your way up to the higher magnifications. Note: Microscope magnification = individual objective magnification multiplied by the eyepiece magnification (10x in this microscope).
4. Adjust the eyepiece spacing to fit your eye spacing by moving the eyepieces in and out until a complete circular image is obtained when viewing through both eyepieces.
5. **Focusing**
  - a. Raise the specimen stage by turning coarse focusing control (the large knob) until you get an image of your device. Be careful not to contact the objective with your sample.
  - b. Use the fine focusing control (the small knob) to get a clear image.

6. **Illumination:** Brightfield and darkfield illumination are available.

- a. Usually we use brightfield illumination to inspect devices. The reflector slider should be in the H (brightfield) position.
- b. Darkfield illumination can be applied by changing the reflector slider from the H (brightfield) position to the D (Darkfield). It is applied to examine scratches, fissures, and pores, which deviate from the flatness of the surface. Such light scattering features light up in darkfield, while the specular flat surfaces remain dark.

**NOTE:** Aperture and field irises must be open to avoid light losses when you are using Darkfield illumination.

7. Pushrods and screws located on the side of the microscope.

- a. The setting screws for Aperture and Field Irises are for centering the individual irises.
- b. Pushrods for Aperture and Field Irises: To the left -iris open. To the right -iris closed.

**NOTE:** Aperture Iris is for adjusting the image contrast. Field Iris is for changing the size of viewing area.

- c. Pushrod for Diffuser: To the left -diffuser is out. To the right -diffuser is in.

8. **Measurement:** A ruler reticle in the left eyepiece allows direct measurement of device features.

50× -> 20 μm/div  
100× -> 10 μm/div  
200× -> 5 μm/div  
500× -> 2 μm/div  
1000× -> 1 μm/div

9. **Photographs:** A Polaroid camera attaches to the top of the microscope for easy photographing of devices.

10. When you finish with the microscope, LOWER the specimen stage first. Then take your device out.

11. Shut off the power for the lamp.