

Module 9: Microscope Maintenance

Learning Objectives

At the end of this module, you will be able to

- Store the microscope properly
- Clean the microscope including the eye pieces and objective lenses
- Replace the microscope bulb
- Troubleshoot the common problems associated with use of microscope

Content Overview

- Microscope storage conditions
- Materials required for Microscope Maintenance
- Cleaning solutions and solvents required to clean optics, stage, and body
- Materials required for cleaning

Microscope Storage

- Proper storage of the microscope will prevent or reduce problems!
- Optics and mechanisms of the microscope must be protected from:
 - Dust and dirt
 - Fungus
- Store the microscope
 - Under a protective cover
 - In a low humidity environment

Cleaning Solutions and Solvents



- Soap solution for cleaning of body and stage
- Ether-Alcohol, Alcohol, or Lens Cleaner Solution for cleaning of lenses
- Refer to manufacturer's guide for appropriate organic solvent

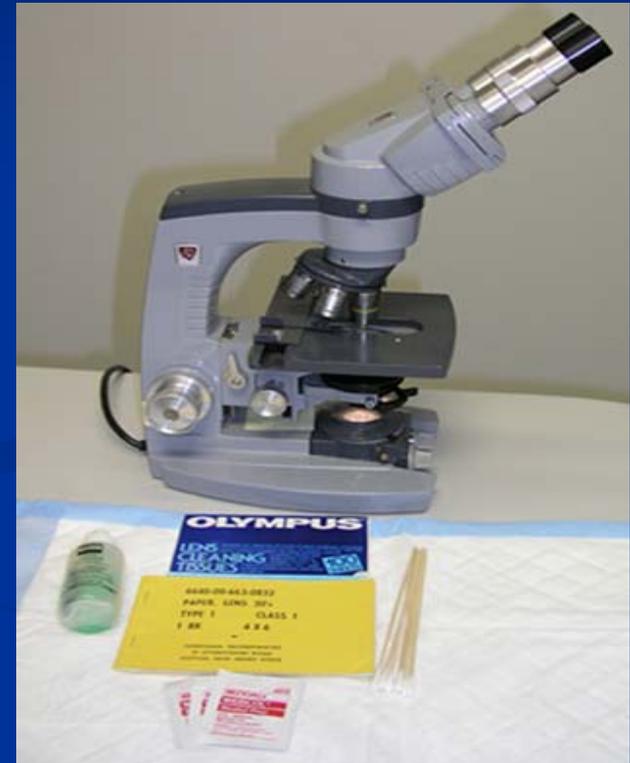


Cleaning Solutions

Cleaning Solutions	Frequent Use	Infrequent Use
Manufacturer's recommendation	Yes	Yes
Ethyl ether/alcohol (80/20)	Yes	Yes
Alcohol	No	Yes
Benzene / petrol	No	Yes
Xylol	No	No

Cleaning Materials

- Lint-free cotton gauze pads
- Lint-free cotton swabs
- Lens paper
 - Alternatives include:
 - Fine quality tissue paper
 - Muslin cloth
 - Silk

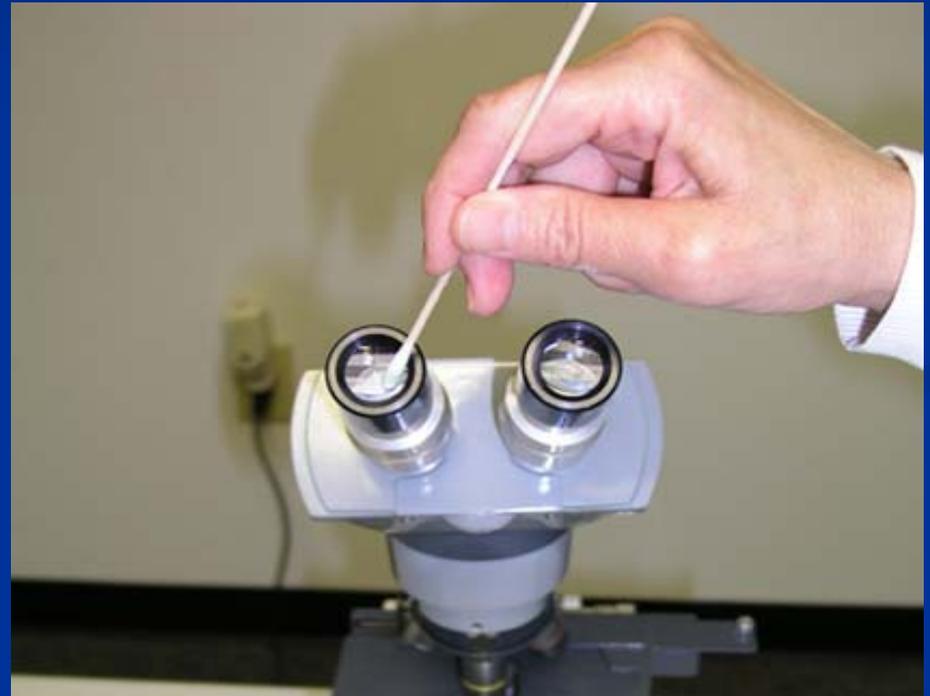


Microscope Cleaning Process

- Cleaning the Eyepiece
- Cleaning the Objectives
- Cleaning the Microscope Stage
- Cleaning the Microscope Body
- Cleaning the Condenser

Step 1: Cleaning the Eyepieces

- Blow to remove dust before wiping lens
- Clean the eyepieces with a cotton swab moistened with lens cleaning solution
- Clean in a circular motion inside out



Step 2: Cleaning the Eyepiece

- Wipe the eyepieces dry with lens paper
- Repeat cleaning and drying if required



Step 3: Cleaning the Objectives

- Objectives are cleaned while attached to microscope
 - Moisten the lens paper with the cleaning solution
 - Wipe gently the objective in circular motion from inside out
 - Wipe with dry tissue or lens cleaning paper
- Objectives should never be removed from the nosepiece.

Step 4: Cleaning the Microscope Stage

- Wipe the microscope stage using the cleaning solution on a soft cloth
- Thoroughly dry the stage
- Repeat above steps, if required



Step 5: Cleaning the Microscope Body

1. Unplug the microscope from power source
2. Moisten the cotton pad with a mild cleaning agent
3. Wipe the microscope body to remove dust, dirt, and oil
4. Repeat steps 1–3, if required

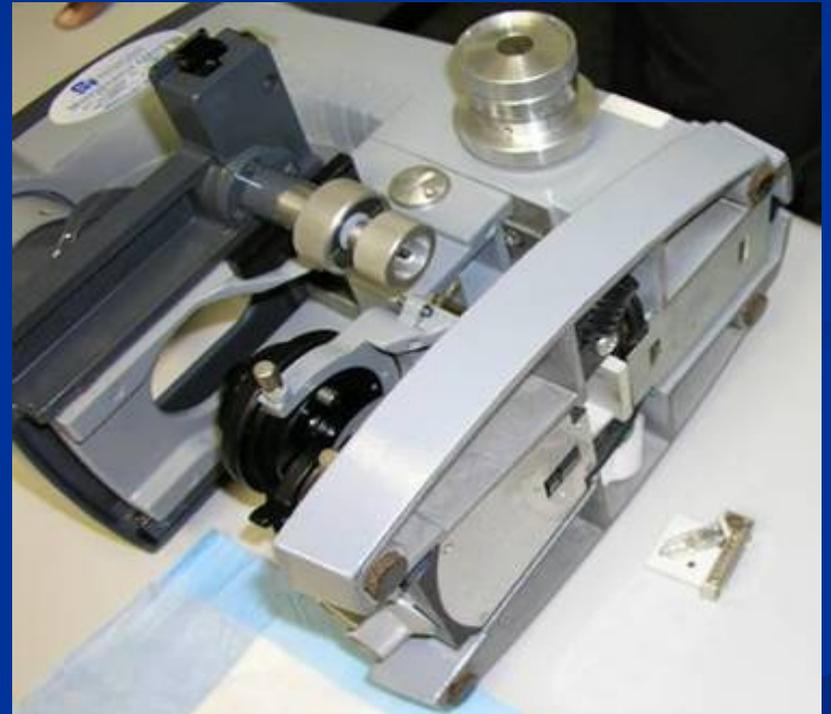
Step 6: Cleaning the Condenser and Auxiliary Lens

- Unplug the microscope from power source
- Clean the condenser lens and auxiliary lens using lint-free cotton swabs moistened with lens cleaning solution
- Wipe with dry swabs



Replacing the Microscope Bulb

- Unplug the microscope from power source
- Find location of bulb
- Follow manufacturer's instructions to remove the bulb



Replacing the Bulb (Cont.)

- Use tissue paper or an appropriate device to remove the bulb from the microscope
- Check the model number on the bulb to ensure the use of correct replacement bulb.
- Replace the bulb by holding it with lens paper or an appropriate device.

Never touch the bulb with your fingers.



Microscope Repair

- Never disassemble the microscope
 - Optics: eyepieces and objectives
 - Mechanics: stage and focus adjustments
- Repair of these items requires service engineer

Demonstration: Microscope Bulb Replacement

Troubleshooting Problems

- Many common microscope problems can be prevented or repaired by routine cleaning, adjustment, and maintenance
- Seek professional service for problems you cannot fix

Problem: Eye Strain and Headaches

- Adjust interpupillary distance
- Adjust eyepiece diopter setting
- Use matched eyepieces

Problem: Poor Image Quality

- Clean objective and lens
- Clean scope thoroughly
- Check oil, replace if any contamination or haze is visible
- Ensure the slide is thoroughly dry before applying oil

Problem: Uneven Illumination

- Ensure nosepiece is rotated to position where it clicks into place
- Center condenser
- Adjust Kohler illumination
- Check to see bulb is correct model

Problem: Constant Refocusing

- Be sure slide is flat on stage
- Clean stage and underside of slide
- Be sure microscope is on flat and leveled surface

Problem: Surging or Flickering Light

- Loose plug or connection
- Clean bulb contacts (Unplug from power source)
- Assure halogen pins are in full contact
- Bulb needs replacement
- Check to see if cord is damaged - Replace, if any wear and tear is visible
- If voltage supply is erratic, use a voltage stabilizer

Microscope Maintenance-1

- **Daily Maintenance**

- Optimum illumination
- Cleanliness
- Light bulb
- Immersion oil
- Check cord
- Keep it covered

- **Professional Service**

- Minimum of once a year if possible
- Problem you cannot fix

Microscope Maintenance-2

- Maintain a Log Book for
 - Problems
 - Routine maintenance
 - Repairs
 - Spares

Summary

- What is another term for “eyepiece”?
- What are two reasons for problems with brightness of the viewing field?
- Define the purpose of a cabinet box.