

Optical Cleaning

Begin with the optical cleaning of a compound microscope, starting from the top with the eyepieces, and moving downward.

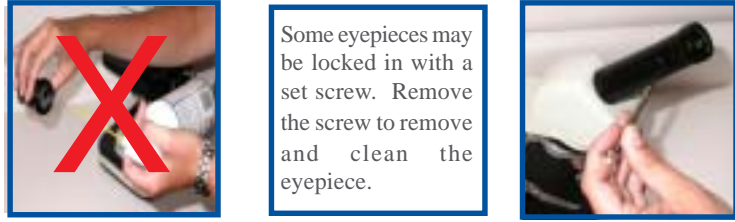
1

Lenses are easily scratched with abrasive materials, so remove the larger particles first with air and/or soft brush. Use the air duster in a vertical position.



2

Never use an air duster tilted sideways or upside down. It will spray a residue onto your optical surface. You may need to air dust the back side of the eyepiece, but only if debris is visible on the rear lens.



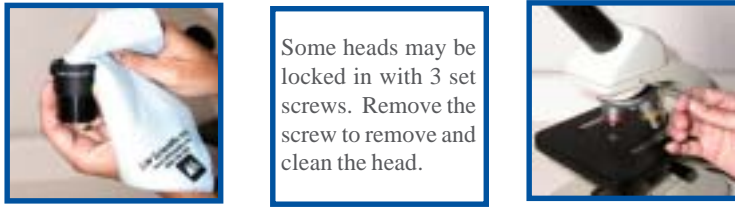
3

Next, add a drop or two of lens cleaning fluid to a cotton-tipped applicator swab. Then begin cleaning in the center of the eyepiece, using a circular motion towards the outer edge.



4

Gently dry the surface with lens paper or lens cloth in a circular motion. Do not attempt to clean the inside of the eyepiece.



5

Remove the head from the microscope. Make sure your eyepieces are not in the head. Only if visible debris is on a prism inside the head, blow air into each tube while holding the eyetubes tilted downward. Clean the lens on the bottom of the head similar to the steps above.



6

Remove each objective, and clean the front lens only. Use the same procedures as above, with lens cleaning fluid and swab. A drop of lens fluid onto lens paper works well too. Fold a corner of lens paper to get into the edges. Use an eyepiece backwards to inspect the lens...notice the lens is recessed below the metal housing on many objectives. Never clean inside the rear of the objective (use air only if debris is in rear of objective).



7

Remove the ABBE condenser and clean using the same procedures above, or simply wipe with lens cloth. The base condenser lens should also be brushed and wiped clean. Use the dust brush to keep all the crevices of your microscope free from dust and dirt. Do not brush or wipe across the bearing and gear tracks...you don't want grease on your lens cloth or dust brush.



8

For stereo microscopes, use the same procedures in steps 1-5. Clean only the front lens of the objectives. Remove and clean both sides of the protector lens or supplementary lenses. Wipe any light source cover lenses or stage plates with lens cloth.

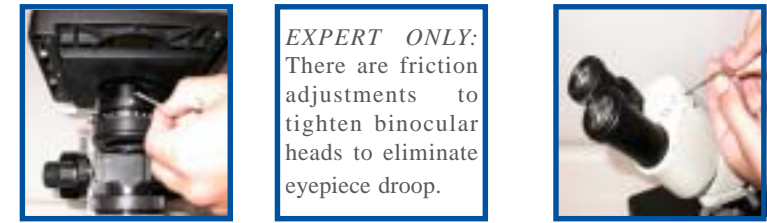


Mechanical Servicing

Stages should be lubricated yearly (more often with heavy use or if motion is tight). Move each bearing track fully one direction, and place a dot of Micro-Glide as close to the inside of the track as possible. Then move the track to the opposite side and apply a dot there as well. Don't forget the front/back track under the stage. Work the lubricant in by moving the stage back and forth. Do not grease the gears.



Abbe condensers need to be centered under the objectives. Look through the scope with the 4x objective in place, close the iris and make sure the field of light is centered in the field of view. There are usually 3 alignment screws to center the condenser.



EXPERT ONLY: Many scopes have tightening screws for the focus mechanism on the side of the scope body, which can eliminate stage wobble. These screws tighten against an internal rack. Do not force these screws inward too tightly or your stage motion will become too tight. Call the manufacturer for advice.



Many educational compound scopes and stereoscopes use a friction collar for coarse focus tension. If the coarse focus is too hard or too easy to turn, use the C-wrench to tighten the friction collar.



Helpful Hints

- Is there a black spec in your field of view? Narrow down the location by turning each eyepiece to see if the spec turns around. Check other objective powers to see if it is in only one objective. Slightly unscrew the objective 1/4 turn, and see if the spec turns around with an objective. Maybe it is on the ABBE condenser...turn it around too. If the spec does not move when turning the eyepieces, objectives, or condenser, then it is likely in the head or on your slide.
- Your blue Micro Fiber Lens Cloth can be washed repeatedly without harm. The fibers are 10 times finer than silk and the cloth is chemical free. This cloth is 80% polyester and 20% polyamide (nylon).
- Clean the oil off the 100x objective with lens paper after every use. Leaving oil on the objective will attract dust.
- Use regular Windex or 409 and a paper towel to clean the painted surfaces of your microscope.
- Use only LW Scientific's Multi-Coated lens cleaning fluid or other fluid designed especially for multi-coated optics. Fluids should be non-abrasive and leave no residue. Other fluids such as isopropyl alcohol or Xylene should only be used by qualified technicians.
- Make sure your halogen light bulb is perfectly aligned under the base condenser. On many scopes, you can turn the light on (dim) and lift the scope up to look up through the bulb door vent holes. Make sure the filament is perfectly in the center of the lens. Halogen bulb brackets are usually mounted on a slotted hole, and can be aligned using a screwdriver.

Terms and Definitions

Objectives

Achromatic-	Color-corrected (without color) (common microscopes)	70-80% flat field of focus
Semi-Plan-	Better quality achromatic lenses (medical grade)	85-95% flat field of focus
Plan-	Best quality lenses (laboratory grade)	100% flat field of focus
DIN-	Deutsch Industrie Norm, 160mm tube length between eyepieces and objectives. Standard size.	
Infinity -	Advanced laboratory optics. Tube length longer than 160mm. Parallel optical path out of objective (not diverging) gives better clarity and allows for adding components below head.	

Oil Immersion - High-power objectives (like 100x and 50x) use oil between the slide and objective for high resolution.

Parfocal - Specimen remains in focus as you switch between objective powers (within 1/4 turn of fine focus).

Head

Seidentopf - Sliding -	Two eyetubes move apart like binoculars for interpupillary adjustment (width of eyes).
Diopter Adj. -	Two eyetubes slide outward for interpupillary adjustment.
Compound -	Allows one eyepiece to be moved in or out to compensate for difference between eye focus.
Stereo -	Traditional microscope with objectives, used to look at glass slides at magnifications 20x to 1500x.
Nosepiece -	Microscopes that use paired objectives to create 3-D views of objects at mag. between 5x to 200x.
Condenser -	Holds objectives, rotates on ball bearing, forward-facing or rear-facing.
Diaphragm -	Focuses a "brightfield" of light inward toward specimen. Abbe type has multiple glass lenses.
N. A. -	Adjusts the width of the light path and numeric aperture. Iris-type and Disk-type are common.
Light Source -	Numeric aperture is a measure of an objective's ability to gather light and resolve detail.
Filters -	Common types are tungsten, fluorescent, halogen, and LED cordless.
	Colored filters are used for contrast – blue is most common.

Re-Order Information

M-PSK	Pro Service Kit
M-SCK	Standard Cleaning Kit
M-GUST	Air Dust 8 oz.
M-LP280	Lint-free lens paper - 280 sheets
M-LCF	Multi-Coated lens Fluid - 1 oz.
MC-CTIP	Cotton-tipped applicators - 100

M-CS-SM	Carry case - small
M-CLOTH	Micro fiber lens cloth
M-BRUSH	Dust brush
M-GLIDE	Micro-Glide lubricant
M-C-WRCH	C-wrench
M-A-SET	Allen wrench - set of 3
M-6SCR	Screwdriver - set of 6

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LW Scientific is an American-owned, ISO 9001 certified manufacturer of laboratory microscopes and equipment. Our customer service and technical support staff is eager to help with any question or comment you may have. Visit our website at www.lwscientific.com for the latest product information and accessories. We appreciate your purchase!

Introduction

Keep your optical equipment operating flawlessly with the new Pro Service Kit from LW Scientific, Inc. Who could know more about optical performance than a manufacturer of laboratory microscopes? Even a novice can perform expert scope service using this easy-to-understand picture manual in the Pro Service Kit. All tools are included for routine adjustments, alignments, and assembly, and the specialized cleaning supplies are gentle enough to protect the most delicate multi-coated optics. We know that a booklet of 25 lens papers wouldn't last 2 weeks in a lab, so we've included large-sized supplies that will last much longer. Visit www.lwscientific.com or call your distributor to reorder supplies.

Standard Cleaning Kit



The Standard Cleaning Kit is designed for routine daily cleanings, but contains larger quantities of supplies than other kits. Designed especially for microscope optics, our 1 oz. multi-coated lens cleaner leaves no residue or film on the optical surfaces. The large 8oz. air duster, 100 cotton-tipped applicators and 280-sheet lens paper dispenser lasts months.

Pro Service Kit



The Pro Service Kit contains the cleaning supplies listed in the Standard Cleaning Kit, plus 6 screwdrivers, 3 allen wrenches, 1 dust brush, 1 lint-free lens cloth, 1 tube of Micro-Glide lubricant, 1 C-wrench for tension collar, and a black nylon carry bag. Accomplish nearly all routine microscope maintenance and service requirements with this kit.

Getting Started and General Precautions

- Keep your microscope covered when not in use...this is the best way to keep your scope clean. Small, medium and large vinyl dust covers are available from LW Scientific, which work with any brand of microscope.
- Never remove the head, eyepieces, or objectives for extended periods. This will help keep the inner optics on your scope free from dust and moisture.
- Read the owners manual completely, and review any service diagrams before beginning.
- Clean your microscope after every 20 hours of use, service and lubricate your microscope yearly. Heavy usage will require more frequent cleaning and servicing.
- Most objectives are not sealed. Never apply cleaning fluid directly to an objective lens...it could get behind the front lens.
- Only qualified service technicians of authorized LWS service reps should open a microscope head or objective to access inner lenses and prisms. These surfaces should not require cleaning. Your warranty could be voided if attempted.
- Prepare a clean, dry, and open work area before beginning to service your scope.
- And most importantly, if you aren't sure...DON'T DO IT...call the manufacturer or a qualified technician.