

Standard Cleaning Kit  
Includes:



## Getting Started and Precautions

- Keep your microscope covered when not in use. This is the best way to keep your scope clean. Medium and large nylon 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 microscope 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 or 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.

## Optical Cleaning

### Eyepieces:

- 1 Eyepieces will usually pull straight out of the eyetube on the head for easy cleaning. However, some eyepieces have a small set screw on the side of the eyetube that will need to be loosened to release the eyepiece.
- 2 Lenses are easily scratched with abrasive materials, so remove the larger particles first with the Rocket Duster and/or the soft dust brush. 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 or lens paper. Then, begin cleaning in the center of the front lens 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 with any cleaning fluid.



### Head:

- 1 Remove the head from the microscope by loosening a thumb screw or set screw. Make sure your eyepieces are not in the head because they could possibly fall out. If debris is visible on a prism inside the head, blow air into each tube while holding the eyetubes tilted downward. If debris is not easily blown off, use a new clean cotton swab to gently touch the debris and sweep it off. Do not ever touch or use cleaning fluid on prisms inside the head.
- 2 Clean the lens on the bottom of the head similar to the steps above for eyepieces.



### Objectives:

- 1 The 4x and 10x objectives rarely need cleaning as they do not touch the slide. To clean an objective, remove it 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.



2 Use a backwards eyepiece to inspect the lens as shown in the picture. Notice the lens is often recessed below the metal housing on the objectives, making it more challenging to clean around the edges.



3 Never clean inside the rear of the objective... use only air if debris is visible in the rear of the objective.

### ABBE Condenser and Base:

1 Clean the upper lens surface of the ABBE Condenser while it is still mounted on the scope using the same procedures above, or simply wipe with dry lens cloth.



2 The base condenser lens should also be brushed and wiped clean often.



3 Use the dust brush to keep all the crevices of your microscope free from dust and debris. Do not brush or wipe across the bearing and gear tracks on and under the stage... you don't want grease on your lens cloth or dust brush.



### Stereoscopes:

1 Remove and clean both sides of the objective protector lens or supplementary lens. Use the same procedures as above. Stereoscopes have objectives that are not removable... clean only the front lens of the objectives.



2 Using cleaning fluid, wipe or clean any light source cover lens or stage plate with lens paper or lens cloth.

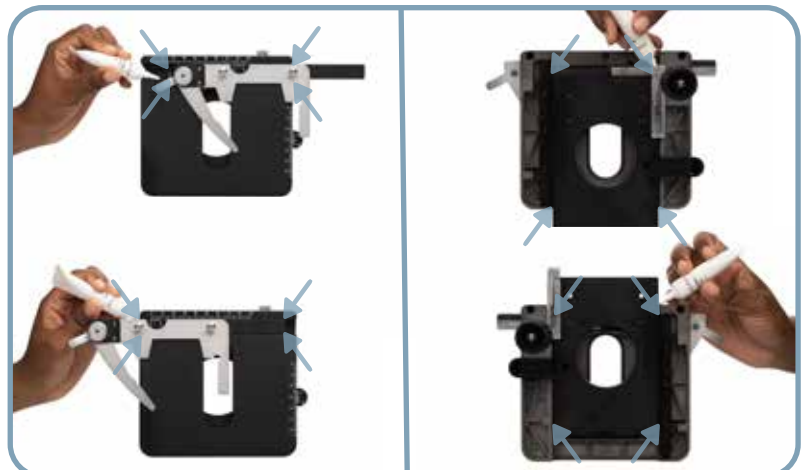


## Mechanical Servicing

1 Stages should be lubricated at least yearly, in the 4 bearing tracks for the left/right and front/back motion. 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 fully the opposite direction and apply a dot there as well (up to 16 total dots of grease applied). Do not grease the gears.

Left/Right Gear Tracks

Front/Back Gear Tracks



- 2 Abbe condensers need to be centered under the objectives for a full field of light. If out of alignment, you will see a dark shadow to one side when looking through the 4x objective. Some microscopes have two angled thumb screws that move the condenser front/back/left/right, but some have 3 small hex screws around the condenser holder rack that allow it to be adjusted.
- 3 Make sure your bulb is perfectly aligned under the base condenser lens. Bulb brackets are usually mounted on slotted holes, and can be aligned using a screwdriver.



## Helpful Hints

- Is there a black speck in your field of view? Narrow down the location by turning each eyepiece to see if the speck 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 speck turns around with an objective. Maybe it is on the ABBE condenser... turn it around too while looking through the microscope. If the speck does not move when turning the eyepieces, objectives, or condenser, then it could be inside the head.
- 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 or possibly begin to harden on the objective lens.
- Use common disinfectant cleaners and a paper towel to clean the painted surfaces of your microscope.
- Use only LW Scientific's lens cleaning fluid or other fluid designed especially for optics. Fluids should be non-abrasive and leave no residue. Isopropyl alcohol is ok for cleaning oil off the 100x, but the lens cleaning fluid is best. Xylene should only be used by qualified technicians and removed quickly.

## Terms and Definitions

### Head

**Monocular:** Has one eyepiece like found on low-cost, high school microscopes.

**Binocular:** Has two eyepieces like found on most professional microscopes, but not a third port for a camera.

**Trinocular:** Has two eyepieces plus a third port up top for mounting a camera.

**Seidentopf:** The two eyetubes move apart like binoculars for interpupillary adjustment (width of eyes).

**Sliding:** The two eyetubes slide outward for interpupillary adjustment.

**Diopter Adjustment:** Allows one eyepiece to be moved in or out to compensate for differences between your left & right eye focus.

### Objectives

**Achromatic:** Color-corrected (without color) (common microscopes) 70-80% flat field of focus.

**Semi-Plan:** Better quality achromatic lenses (medical grade) 90-95% flat field of focus.

**Plan:** Best quality lenses (laboratory grade) 100% flat field of focus.

### Optical System

**DIN160:** Deutsch Industrie Norm, 160mm tube length between eyepieces and objectives. Standard size.

**Infinity:** Advanced laboratory optics for highest resolution and expandability. 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.

**Condenser:** Focuses and condenses a "brightfield" of light inward toward specimen. ABBE-type has multiple glass lenses.

**Diaphragm:** Adjusts the width of the light path and numeric aperture. Iris-type and Disk-type are common.