

Procedure for image blur and poor contrast

Starting position:

Sample is in focus but complete image or large portion of the image looks blurred, low in contrast and out of focus.



1

Recommended procedure:

Is microscope Köhlered?

[▶ Click to watch video](#)



2

A blurred image may not always be due to dirt:

Using an objective with a large numerical aperture in conjunction with a cover slip of the wrong thickness may result in blurred images (spherical aberration). Dry objectives of this type normally have a correction collar, which permits compensation for spherical aberration. Turn the correction collar (while continuously adjusting the focus) until the best image contrast and sharpness is achieved.

Many highly corrected immersion objectives also require specially selected cover slips of a thickness of 0.17 mm, if the best image is required. Immersion objectives should only be used in conjunction with a suitable, bubble-free immersion liquid, such as IMMERSOL from ZEISS.



3

If image still appears blurred, clean the objective as follows:

Unmount the objective.

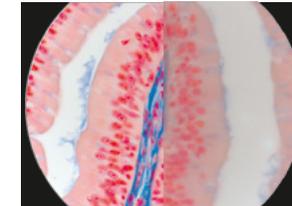
Look through the back of the objective towards a bright background to locate soiling or use eyepiece of microscope, held the other way around to observe the objective front lens in a magnified view.

First use distilled water or breathe on the front lens and clean with cotton swab to remove water-soluble dirt. For cleaning always move the swab (or lens tissue) spirally from the front lens center to the rim.

If result is still not satisfactory, repeat using a solvent such as 70% ethanol to remove oily or greasy dirt (spiral motion).

If required, use diluted dishwashing liquid and clean front lens with cotton swab to remove oily dirt (spiral motion). Dip the cotton swab into the cleaning solution and shake off excess liquid.

Inspect the front lens after each cleaning step.



A dull image despite clean optics is caused by spherical aberration: Correction collar of the Plan-APOCHROMAT 40 / 0.95 objective adjusted correctly (left) and incorrectly (right). Small intestine of a frog, stained with Azan, brightfield

Note:

For cleaning, move the cotton swab always in a spiral motion from the center to the rim. Never wipe in a zigzag pattern!



Seeing beyond