How to Calibrate Back Focus on Your DZOFilm Pictor Zoom Lens

Tools & Setup

- [ ] Pictor Zoom Lens (e.g., 50-125mm)
- [ ] Shim Set (e.g,. 0.03mm, 0.05mm, 0.10mm, 0.30mm, 0.50mm)
- [ ] Mount Adapter (PL to EF if applicable)
- [ ] Camera body (e.g., BMPCC 6K)
- [ ] Precision screwdriver
- [ ] Printed Siemens star chart

Siemens Star Chart

Place this chart exactly 4.9 ft (1.5 meters) from your camera's sensor plane. Center it in the frame and ensure it's mounted level to the lens axis. This chart will help determine back focus sharpness across the zoom range.

Download Siemens Star Chart

Ensure a clean, dust-free environment and organize your shims before disassembly.

Pre Test Step-by-Step

1. Remove the PL mount by unscrewing all eight screws.
2. Carefully remove all pre-installed shims and arrange them according to labeled thicknesses.
3. Select your starting shim configuration (a total of 0.85mm is a good baseline).
4. Align the new mount (EF or PL) by its guide notch and insert screws diagonally to distribute pressure.
5. Lightly tighten only two screws (diagonally) at first to test fit and alignment.

Test Setup

- [ ] Mount the camera and attach the lens.
- [ ] Use and secure the tripod to prevent movement during measurement.
- [ ] Print and mount a Siemens star chart 4.9ft (1.5m) from the camera sensor plane.
- [ ] Ensure your aperture is fully open to reveal maximum lens characteristics.

Test (Finding S1 & S2)

1. Zoom to the longest focal length (e.g., 125mm).
2. Focus on the Siemens star chart until it is perfectly sharp
3. Record this focus distance as S1.
4. Zoom out to the widest focal length (e.g., 50mm).
5. Re-focus on the chart
6. Record this focus distance as S2.

Adjust Shims:

S2 > S1 - Remove Shims (you are too far forward)
S2 < S1 - Add Shims (you are too far back)

Repeat the Test, adjusting the shim stack until S1 and S2 are equal.

For your Second Test, pick a Shim Stac thickness of 0.3mm or lower to get a result where S2 < S1.

Once you have two extreme Shim Stack values, you can adjust the Shim Stack value somewhere in the middle to find the correct value.

Real-World Test Example

First Test:

Shim Stack = 8.5mm
S1 = 1.5m
S2 = 1.7m
Indicates over-shimmed.

Second Test:

Shim Stack = 0.5mm
S1 = 1.5m
S2 = 1.6m
Indicates over-shimmed.

Final Test:

Shim Stack = 0.3mm
S1 = 1.5m
S2 = 1.5m
Parfocal confirmed.
Zooming from 50mm to 125mm shows the subject remains in focus.

After Mount Flip:

When I flipped the EF mount, the Shim Stack value changed. Here are the final values:

Shim Stack = 0.7mm
S1 = 1.5m
S2 = 1.5m
Parfocal confirmed.
Zooming from 50mm to 125mm shows the subject remains in focus.

Tips & Recap

- Prepare a clean and tidy environment. Unscrew the existing mount and arrange all the shims.
- Select a large value for your Shim Stack (e.g., 8.5 mm).
- Start with just two diagonally opposed screws on the mount when testing.
    - Mount orientation affects calibration. Flipping the EF mount will cause the back focus to shift. Select the orientation of the mount before beginning the tests.
- Record S1 (focus distance at longest focal length) and S2 (focus distance at widest focal length) values.
- Remove Shims from Shim Stack if S2 > S1 or Add Shims to Shim Stack if S2<S1.
- Repeat the process until Parfocal is achieved.
- Always document your shim values and configuration. Find extreme values and work your way to the middle.
- Parfocal: when zooming (moving from the longest focal length to the widest focal length), the subject should remain in focus without refocusing.