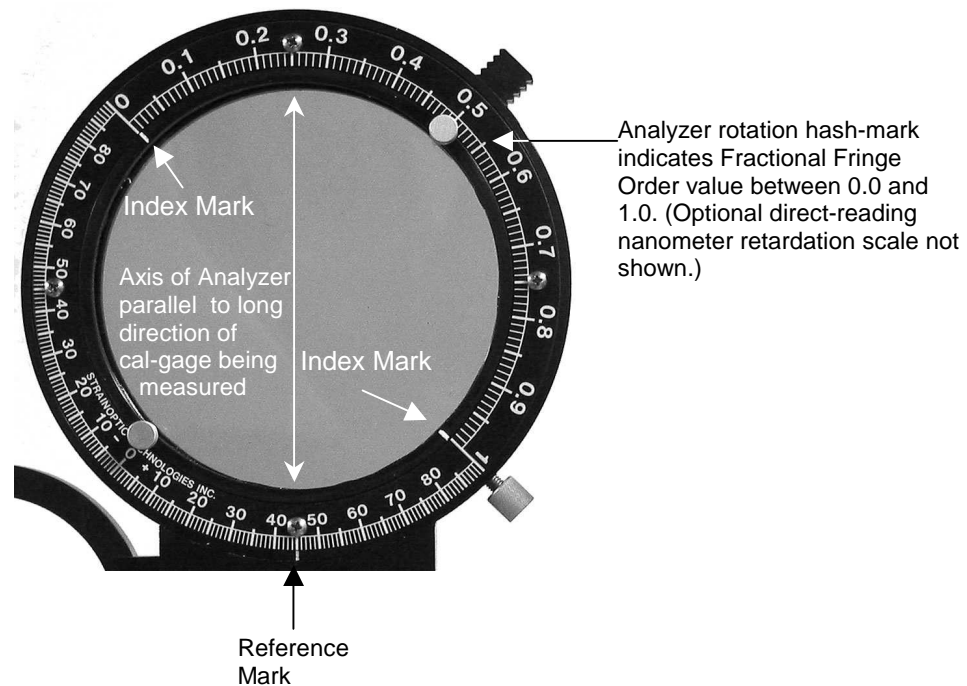


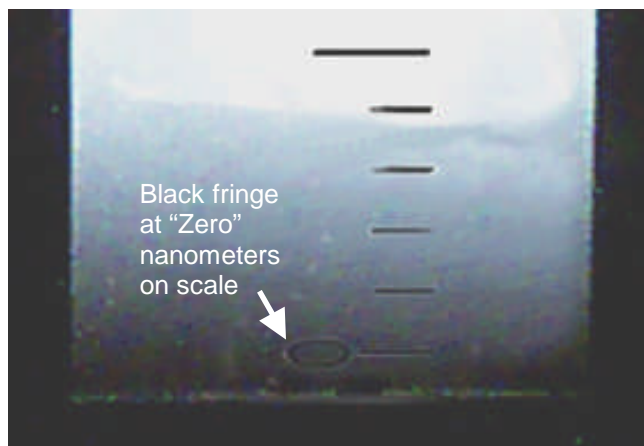
# Strainoptics Reflective Cal-Gage Instructions for Use with Strainoptics VRP-100 Polarimeter

The Strainoptics Reflective Cal-Gage is a calibrated linearly variable retarder that exhibits a known retardation value over its length, e.g., 0-200 nm. It is generally used to verify instrument operation as shown in the instructions below, but is also a valuable tool for demonstrating birefringence and photoelastic measurement practices.

1. Ensure that your VRP-100 is set up properly, as shown in the Strainoptics VRP-100 manual. Verify that the tint plate is NOT in the field of view. Rotate the Analyzer so that the Index Marks are aligned with the number "1" and "0" on the Analyzer Scale.



2. Position the reflective cal-gage in the analyzer's field of view in a vertical orientation (with its long side parallel to the Reference Mark on the analyzer). A black fringe will be observed at the 0 nm location on the cal-gage scale. If it is not, review the VRP-100 setup instructions.

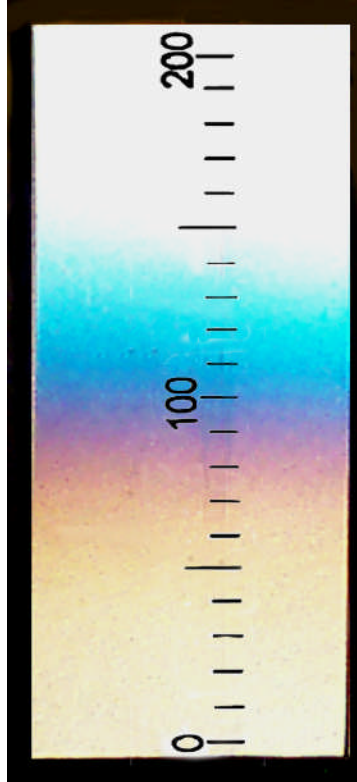


## VRP-100 Cal-Gage Instructions, Continued

3. Rotate the Analyzer clockwise and the black fringe will move upscale, changing color as the observed retardation increases. Stop rotating the analyzer at the point where the fringe's blue-pink interface meets the 100 nm point on the cal-gage scale.



Cal-Gage before Analyzer Rotation (Black fringe is at zero nanometers on scale)



Cal-Gage after rotating Analyzer clockwise until center of fringe (blue-pink interface) reaches 100 nanometers on scale

4. Make note of the number (between 0.0 and 1.0 where the analyzer index mark meets the hash-marks on the Analyzer scale. This is the Fractional Fringe Order value. (If your VRP-100 was supplied with a direct-reading retardation scale on the Analyzer dial, you will be reading the retardation value directly. In this case, skip Steps #5 and 6.)
5. Multiply the Fractional Fringe Order value by 570 nm (the wavelength of white light passing through the cal-gage).
6. To arrive at measured retardation, divide the product from Step #5 by 2 (since the light passes through the cal-gage twice in reflection). If the result is  $100 \pm 5$  nm, the VRP is measuring properly and calibrated to the Cal-Gage.
7. **OPTIONAL:** To conform to ASTM Test Method C1426, Verification and Calibration Procedures, Procedure B, "Calibration of Polarimeter Using a Calibrated Retarder," repeat the measurement five (5) times and calculate the average retardation. The result should equal  $100 \pm 10$  nm. For more details, visit [www.astm.org](http://www.astm.org).

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