

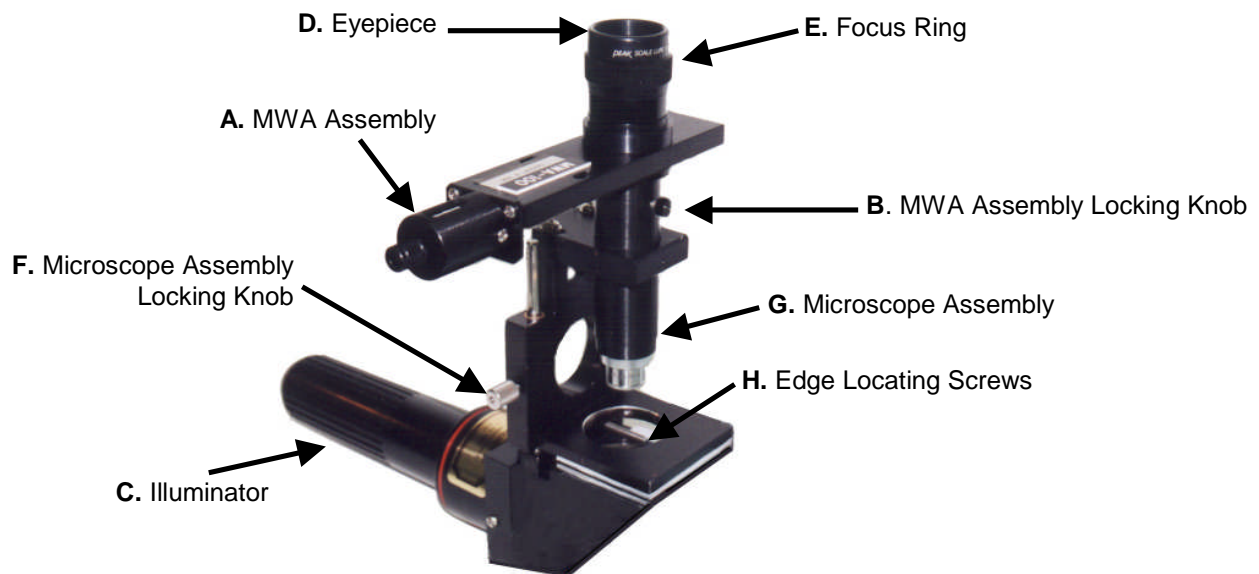
# Strainoptic<sup>®</sup> GES-100-MWA

## Quick-Start Guide for Measuring Edge Stress

Note: These instructions are not meant to replace the full Strainoptic GES-100-MWA instruction manual supplied with your polarimeter. If you are not yet familiar with the initial setup, general operation, and maintenance requirements of your instrument, or if questions arise, please refer to the complete manual for further details. Before proceeding, we recommend that you become familiar with the names of the various instrument components as shown in the illustration below.

**In order to calculate stress in your material, you must know its thickness in millimeters and its material stress constant in Brewsters. The Brewster constant for soda lime glass is 2.6.**

1. Make sure that the MWA Assembly (A) is locked into the correct position (perpendicular to the illuminator handle) using the MWA Assembly Locking Knob (B).
2. Turn on the illuminator (C) and set the MWA counter dial to zero (000).
3. While looking through the eyepiece (D), turn the focus ring (E) until the reticle scale comes into sharp focus.
4. Loosen the microscope assembly locking knob (F) and raise the microscope assembly (G).
5. Insert the glass sample so that the edge rests against the edge locating screws (H)
6. Lower the microscope assembly to gently hold the sample. **DO NOT FORCE – NO CLAMPING PRESSURE IS NEEDED.** Tighten the locking knob.



7. The image seen through the eyepiece should resemble Figure 1.
8. If the glass edge does not appear in focus, rotate the focus ring until the edge is brought into focus.
9. Observe the position of the black fringe on the glass.

# Strainoptic GES-100-MWA

## Quick-Start Guide, Continued

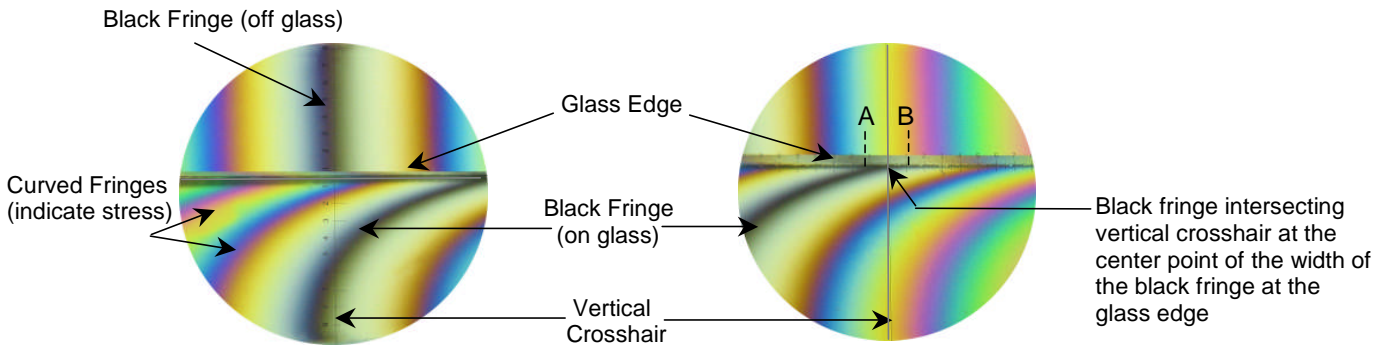


Figure 1. Typical image through eyepiece with dial at zero. Turn counter dial and fringes will move.

Figure 2. Image through eyepiece with vertical crosshair and black fringe coincident at glass edge. This is the proper position from which to take reading.

10. Turn the MWA counter dial either clockwise or counter-clockwise in order to move the black fringe on the glass to where the vertical crosshair is centered between points A and B at the glass edge, as shown in Figure 2. *(The points labeled "A" and "B" are meant to represent the width of the black fringe at the glass edge and do not actually appear.)*
11. When all three elements intersect (vertical crosshair, black fringe, glass edge), note the 3-digit reading from the MWA counter dial. Subtract 1000 from the reading to arrive at the correct value. This will be a negative number and implies compression at the edge.  
Example: 870-1000 = Counter value of -130.  
Write this value down: \_\_\_\_\_.
12. Multiply the value from Step 11 by the compensator constant supplied with your instrument. This value is the measured retardation in the glass sample at the observed edge.
13. To convert retardation to stress in MPa or psi, refer to the conversion table supplied with your instrument (for soda lime glass) or use the following equation:

$$\text{Edge Stress (MPa)*} = \frac{\text{Retardation (nm)}}{\text{Material Constant (Brewsters) X Thickness (mm)}}$$

\*Multiply by 145 to convert to psi.

14. If you are having difficulty using the GES-100-MWA polarimeter, and cannot solve the problem by referring to the complete instruction manual, please contact a Strainoptic Technical Support Representative.

NOTE: If your glass has a ground or seamed edge, and you need a measurement of residual stress at the actual edge (rather than near the edge), please refer to the Strainoptic publication, "Measuring Edge Stress in Glass Using the Near-Edge Procedure," available on request.