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## Operating Instructions



**Column 4 on the left:**  
reflection off of far surface  
of 2nd pane

**Column 1 on the right:**  
reflection off of first surface or  
contacting surface

The Strengthened Glass Detector identifies if a piece of glass, or a dual pane window has been strengthened.

The SG2700 allows the user to easily view the stress lines that occur in glass that has been strengthened. Therefore, you can determine if the glass has been strengthened. It also will estimate the thickness of the first pane of glass.

**At left:** SG2700 inspecting a dual pane window. Note that one reflection column occurs for each glass surface

### Features:

- Single or double pane testing accomplished from a single side
- Test single panes of glass or double pane windows in the production environment
- Test single or double pane windows that are already installed in the field
- Wide viewing area illuminated by multiple light sources
- Pane 1 glass thickness measurement
- Head-on viewing of reflections for easy measurement
- Special viewing optics to accentuate the color changes
- Identify the location of stress lines in the glass
- Automatic power-off feature to prolong the life of the battery
- Low power usage allows for standard 9-volt alkaline battery operation
- Low battery indicator
- Simple operation
- Convenient push-on/push-off power switch
- Small, portable convenient size
- Protective carrying case

### Basic Operation

Place the SG2700 flat against the glass to be tested. When possible, place the meter on the side of the glass that will allow for the darkest background behind the glass. Turn the meter on, and look through the specialized viewing port to view reflections off the glass surface. Single panes of glass will result in 2 columns of reflections (one from each glass surface) while double pane windows will result in 4 columns of reflections. For best viewing results, look at the reflections in the viewing port head-on, not at an angle. You will use these reflections to determine if the glass has been strengthened.

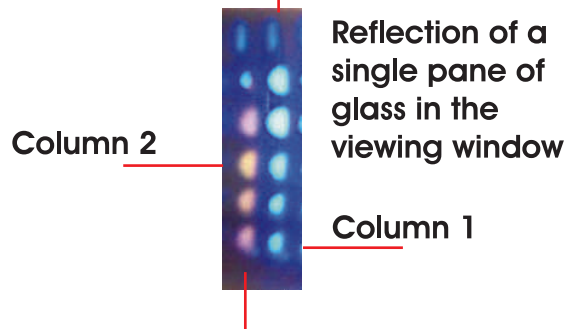
## Single Pane / First Pane Detection

- 1) Place the meter on the glass. You will see 2 columns of light reflections (one column for each surface of the glass).
- 2) Slide the meter over a large portion of the glass surface, and pay close attention to the colors of the two columns of light.
- 3) **THE GLASS IS STRENGTHENED IF:**
  - The reflections in column 2 **CHANGE** to a different color than column 1. This means that the meter is detecting a stress line in the glass (strengthened)

**WARNING!** Remember that you are looking for a CHANGE in color of column 2, with respect to column 1. It is possible that column 2 will start out as different color than column 1. This is **NOT** signifying strengthened glass. You must see an actual change of color (stress line) in column 2 to confirm it is strengthened. For soft coat (sputtered) low e coatings and other specialty coatings, the reflection from the surface of glass containing the low e coating may appear as a different color (typically green) than the uncoated surface. Remember you are watching for column 2 to change colors with respect to column 1 as you slide across the glass. If it maintains the same color throughout the travel across the glass, it is NOT strengthened.

- 4) **THE GLASS IS NOT STRENGTHENED IF:**
  - Neither column changes color
  - Both columns change color *together*
- 5) It can be very helpful to **rotate the meter in place** over a suspected stress line. This often makes it easier to confirm whether or not you are detecting a stress line.

**Column 1** on the right hand side represents the surface of the glass that the meter is touching



**Column 2** on the left hand side represents the opposite surface of the glass.

Monitor the colors in column 2. If the colors change to a color different than column 1 as you travel across the glass, this represents stress lines, indicating that your glass is strengthened.

Note that the color change of column 2 compared to column 1 in this example indicates the glass is strengthened.

### **DIFFERENCE** between columns 1 and 2 indicates Stress lines

- or -

### **Strengthened Glass**



Both of the examples inside of this box show differences between columns 2 as compared to column 1. In both instances, this means the meter has detected stress lines indicating that the glass is strengthened.

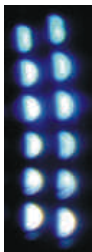


For best results in looking for color change in the left column (2), inspect a large portion of the glass, and rotate the meter in place over suspected stress lines.

### **NO DIFFERENCE** between columns 1 and 2 indicates *no* stress lines

- or -

### **Regular Glass**



In both of these examples, there is no difference between columns 1 and 2. This means that the meter is not detecting any stress lines which indicates that the sample is regular - non strengthened - glass.



Take special notice of the example to the right. The colors near the top of both columns have changed color, BUT since both columns changed together, this still means there is no indication of strengthened glass.

## Second Pane Detection

- 1) Place the meter on the glass. You will see 4 columns of light reflections (one column for each surface of the glass).
- 2) Slide the meter over a large portion of the glass surface, and pay close attention to the colors of the two columns of light farthest to the left (columns 3 and 4).
- 3) **THE GLASS IS STRENGTHENED IF:**
  - The reflections in column 4 **CHANGE** to a different color than column 3 as you slide the meter across the glass. This means that the meter is detecting a stress line created during the strengthening process
- 4) **THE GLASS IS NOT STRENGTHENED IF:**
  - Neither column (3 or 4) changes color
  - *Both* columns (3 & 4) change color *together*
- 5) It can be very helpful to **rotate the meter in place** over a suspected stress line. This often makes it easier to confirm whether or not you are detecting a stress line.

**Column 2** (second from right) represents the opposite surface of the first pane of glass.

**Column 1** (farthest to the right) represents the surface of glass the meter is touching.



**Reflection shown from 2 panes of glass**

**Column 4** (farthest to the left) represents the opposite surface of the second pane of glass.

**Column 3** (second from left) represents the closest surface of the second pane of glass.

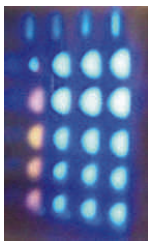
For second pane detection, monitor the colors in **column 4**. If the colors change to a different color than column 3 as you slide across the glass, this represents stress lines indicating that your second pane of glass is strengthened.

Note that the color change of column 4 with respect to column 3 in this example indicates that the second pane of glass is strengthened.

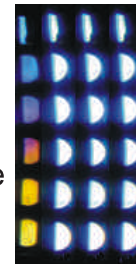
### **DIFFERENCE** between columns 3 and 4 indicates Stress lines

- or -

#### **Strengthened Glass in pane 2**



Both of the examples inside this box show differences between columns 3 and 4. In both instances, this means that the meter has detected stress lines indicating that the second pane of glass is strengthened.



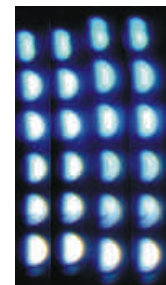
For best results in looking for color change in the left column (4), inspect a large portion of the glass, and rotate the meter in place over suspected stress lines.

### **NO DIFFERENCE** between columns 3 and 4 indicates *no* stress lines

- or -

#### **Regular Glass in pane 2**

In this example, there is no difference between columns 3 and 4. This means that the meter is not detecting any stress lines in pane 2, which indicates that the sample is regular, non-strengthened glass.



## Pane 1 Glass Thickness

The SG2700 detector has the added feature of being able to estimate the thickness of glass in pane 1. This feature will work on a single piece of glass or a pane of glass installed in a double pane window.

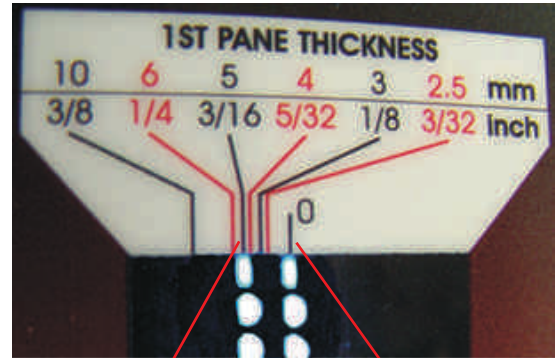
### To conduct a glass thickness estimate:

- 1) Place the detector on the glass and turn it on
- 2) For best results while viewing the image window, stand within 10 inches of the instrument, close one eye, and tilt your head to the left at an approximate viewing angle of 45 degrees.
- 3) Align your eyesight so the column 1 (farthest to the right) reflection is aligned with the "ZERO" line on the Glass Thickness Indicator.

You will notice that the light source element closest to the glass thickness indicator has been reduced in size to help with aligning the zero line.

- 4) After you have centered the Column 1 reflection with the zero line, look at the column 2 reflection (without moving your head) and determine which thickness indicator it is closest to.

This will yield the resulting thickness of pane 1. We recommend taking a couple of measurements to confirm your results. This measurement may feel awkward the first few times. However, after using the instrument a few times, this measurement becomes quick and easy.



With one eye closed and head tilted to the left, line up the right column (1) with the "ZERO" line and determine which thickness indicator the left column (2) is closest to.

In this case, the glass is 3/16" thick as column 2 lines up with the 3/16" thickness indicator.

### Helpful Operating Tips

- 1) When detecting strengthened glass, the angle at which you hold your head is crucial. Align your sight so the reflections look the brightest and show the most contrast in color possible. This is typically accomplished with the SG2700 detector by viewing the reflections head-on. Rotating the meter will usually help accentuate the color differences.
- 2) When the light behind the meter is excessive, block the light by placing your hand on the back side of the window if possible. This makes the color changes much easier to view. This is especially helpful on sunny days when you are on the inside of the building looking out. Best results tend to occur when you are on the outside of the building looking in. Standing on the outside allows you to shield any sunlight that hits the front of the meter.
- 3) When having trouble finding stress lines in the glass, it is helpful to test the glass close to one of the corners. Stress lines are often more frequent in the corner locations, as opposed to the center of the glass.
- 4) Each piece of strengthened glass will have a different number of stress lines. Some will contain numerous lines and be very simple to identify while others may contain only a few. Test the glass thoroughly before reaching your conclusion.

### Battery Replacement

The SG2700 is powered by a 9 volt alkaline battery. When the battery voltage is getting too low to operate the meter, the low battery indicator will turn on. The detector can still be used at this point, but it is recommended that the battery be replaced soon. The lights in the meter will begin to grow dim and make it more difficult to conduct easy measurements. Alkaline batteries are recommended for this product.

### Warranty

The manufacturer warrants all models of the SG2700 to be free from defects in material and workmanship under normal use and services as specified within the operator's manual. The manufacturer shall repair or replace the unit within twelve (12) months from the original date of shipment after the unit is returned to the manufacturer's factory, prepaid by the user, and the unit is disclosed to the manufacturer's satisfaction, to be thus defective. This warranty shall not apply to any unit that has been repaired or altered other than by the manufacturer. The aforementioned provisions do not extend the original warranty period of the unit which has been repaired or replaced by the manufacturer. Batteries are not covered by warranty.

C.R. Laurence Co., Inc. assumes no liability for the consequential damages of any kind through the use or misuse of the SG2700 product by the purchaser or others. No other obligations or liabilities are expressed or implied. All damage or liability claims will be limited to an amount equal to the sale price of the SG2700 as established by C.R. Laurence Co., Inc.