

# Strainoptics

Bulletin RWG 917

## Instruments for Measuring Roller-Wave Distortion

Strainoptics roller-wave gauges are used for measuring roller wave in accordance with ASTM Test Method C1651, Glass Association of North America (GANA), and other accepted test methods. Measured peak-to-valley depth and wave length values are used to calculate optical distortion using a simple equation or supplied Excel software. Strainoptics offers four high-quality roller-wave models with flat-bottom or three-point contact surfaces.

### RWG-DF Digital Flat-Bottom Gauges



RWG-DF Digital Flat Roller Wave Gauges feature a flat, Delrin-coated bottom surface that is 16 inches long. The RWG-DF comes with a digital indicator for easy read-out of peak and valley measurements ( $W$ ). The gauge is used with a measuring tape to determine the roller wave length ( $L$ ), or the distance between two consecutive peaks or troughs (see diagram on next page). The digital gauge can be set to either inches or metric readouts and has a sensitivity of 0.01mm (0.0005 inches).

### RWG-I and RWG-M Flat-Bottom Gauges

These gauges are the same as the RWG-DF in that they feature a flat, Delrin-coated bottom surface. The only difference is the dial; the RWG-I provides an inch readout and the RWG-M a metric readout. They directly measure both peak-to-valley depth ( $W$ ) and peak-to-peak length ( $L$ ) of the roller wave.



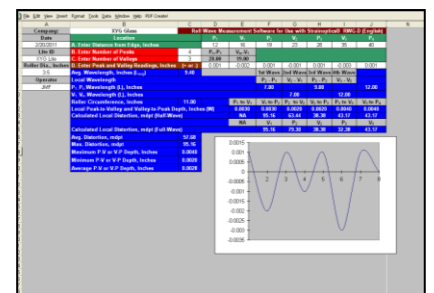
### RWG-D Digital Roller-Wave Gauge



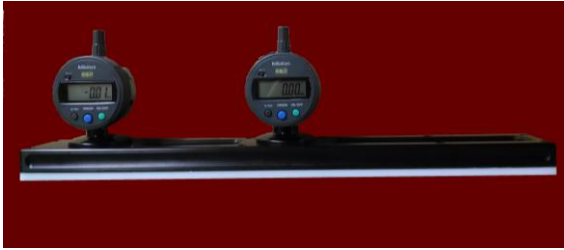
The RWG-D Digital Roller-Wave Gauge features a non-wearing, three-point contact bottom surface and digital indicator readout with a metric resolution of 0.01 mm or an inch resolution of 0.0005 in. The contact point spacing is adjustable to the length of the peak-to-peak roller wave distance for more accurate, repeatable results. A high-sensitivity model (RWG-D-HS) is available for applications requiring high distortion sensitivity (1 mdpt).

### RWG-USB Input Tool for PC Data Entry

This accessory allows automatic direct entry of measured roller wave data into a spreadsheet using button on digital indicator or on remote cable. Works with RWG-D or RWG-DF gauges. Includes Excel® software for easy compliance with ASTM C1651, "Standard Test Method for Measurement of Roll Wave Optical Distortion in Heat-Treated Flat Glass."



## ELG-100 Edge-Lift Gauge

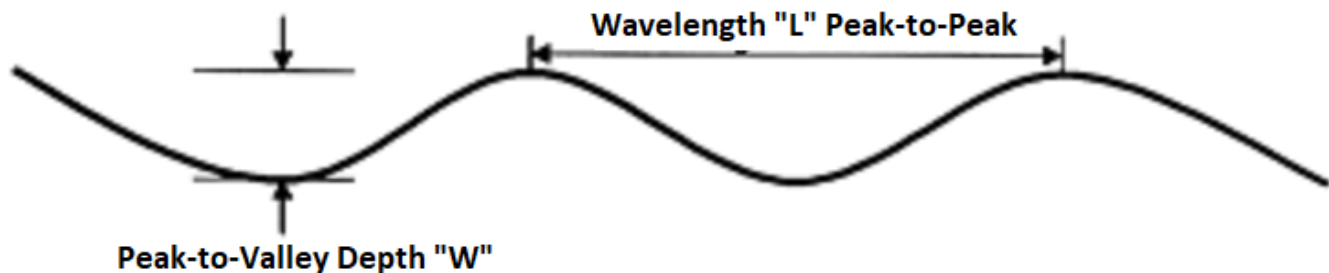


This dual-gauge model has a 16-inch (406 mm) base and is specifically designed for measuring edge-lift (edge curl) in heat-treated flat glass (a requirement of EN 1863-2 and EN12150-2), but can also be used as a flat-bottom roll-wave gauge. Ideal for production control & incoming QC. Controlling edge-lift reduces optical distortion and the chance of field failures in laminated units.

## What Are Roller Waves?

Roller waves are repetitive, periodic waves typically observed in horizontally tempered glass. They can cause distortion of reflected images in architectural glass.

Roller waves result from the glass heat-treating process and occur when the glass reaches a quasi-viscous state as it moves along rollers in a tempering furnace. Some of the factors influencing roller wave include roller bed flatness, roller eccentricity, hot roller run-out, and sag between rollers.



## Roller-Wave Gauge Specifications

Specifications	RWG-I or -M	RWG-DF	RWG-D	RWG-D-HS
Maximum Wavelength (L)	16 in (406 mm)	16 in (406 mm)	14 in (355 mm) Adjustable	14 in (355 mm) Adjustable
Resolution	I: 0.001 in M: 0.01 mm	0.0005 in 0.01 mm	0.0005 in 0.01 mm	0.00005 in 0.001 mm
Distortion Sensitivity	10 mdpt	10 mdpt	10 mdpt	1 mdpt
Output	Dial readout	Digital readout	Digital readout	Digital readout

Strainoptics manufactures a variety of specialized instrumentation for quality control of flat glass products. Instruments range from portable devices to fully automated, PC-based systems. The Strainoptics GASP® (Grazing Angle Surface Polarimeter) measures surface stress to determine if glass is properly heat-strengthened or fully tempered in accordance with ASTM C-1048 and C-1279.