

## GS-191-FA-1045 Rotary Reflectance Measurement System



The GS-191-FA-1045 is a rotary-loaded gonio-reflectance measurement system that automatically captures complete spectral and colorimetric properties for coated glass, polished substrates or diffuse surfaces at 10° and 45° angle of incidence simultaneously, without requiring second-surface masking. Depending on system model, substrates as thin as 0.35 mm can be tested.

Based on high precision spectroradiometric instrumentation, proprietary measurement techniques and expertise in low-light measurement technology developed by Gamma Scientific, the product range features industry-leading accuracy, repeatability and throughput, including both refractive index determination and thin film coating thickness.

## Highly Accurate & Repeatable Reflection Measurements

- Nondestructively capture complete spectral and colorimetric properties
- Isolated first-surface measurement of thin glass substrates down to 0.35 mm in thickness without requiring second-surface masking
- Measure total reflectance or isolate internal optical interfaces
- Test capability for diffuse or specular surfaces
- Programmable, multi-location measurement, pass/fail criteria settings and binning capabilities
- Configuration options including handheld, semi-automatic and fully automatic rotary systems with robotic loading

### Key Application Areas

Anti-reflectance coating characterization

Flat-panel display glass testing

Touchscreen display glass testing

Optical filter / lens testing

Pyrolytic glass coating test & characterization

Flat panel displays, photovoltaic coatings, low-E architectural coatings, paint samples, diffuse plastics

In addition to our exceptional technical and functional capabilities, Gamma Scientific is ISO/IEC 17025 accredited by NVLAP (NVLAP lab code 200823-0).

| Power Supply                                            |                                                                                                                            |                                                                 |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Voltage                                                 | 230V ±5%                                                                                                                   |                                                                 |
| Frequency                                               | 50/60 Hz ±3 Hz                                                                                                             |                                                                 |
| Maximum Output Power                                    | 1000 W                                                                                                                     |                                                                 |
| Rated Power                                             | 500 W                                                                                                                      |                                                                 |
| Rated Current                                           | 2.5A                                                                                                                       |                                                                 |
| Vacuum                                                  |                                                                                                                            |                                                                 |
| Maximum Pressure                                        | -70 (kPa)                                                                                                                  |                                                                 |
| Flow Capacity                                           | >80 (L/min) @ -80 (kPa)                                                                                                    |                                                                 |
| Weight                                                  |                                                                                                                            |                                                                 |
| 1000 kg (Rotary)                                        | 1m open door space reserved around                                                                                         |                                                                 |
| Environment                                             |                                                                                                                            |                                                                 |
| Ambient Temperature                                     | 10 to 35° C                                                                                                                |                                                                 |
| Relative Humidity                                       | <90% non-condensing                                                                                                        |                                                                 |
| Dust                                                    | <0.2 mg <sup>3</sup>                                                                                                       |                                                                 |
| Vibration                                               | <0.98 m/s <sup>2</sup> (0.1G), 10-60 Hz                                                                                    |                                                                 |
| Optical Specifications                                  |                                                                                                                            |                                                                 |
| 191 Optical Head<br>(Optional Geometries of 0° and 20°) | 10 Degree Angle of Incidence                                                                                               | 45 Degree Angle of Incidence                                    |
| Measurement Type                                        | First surface specular reflection                                                                                          | First surface specular reflection                               |
| Sample Types                                            | Glass                                                                                                                      | Glass                                                           |
| Illumination Angle                                      | 10°                                                                                                                        | 45°                                                             |
| Viewing Angle                                           | 10°                                                                                                                        | 45°                                                             |
| Sample Thickness<br>(first-surface reflectance only)    | 0.5 mm or thicker<br>0.35 mm or thicker (GS-191-FA-1045-V)                                                                 | 0.25 mm (transparent samples)                                   |
| Maximum Sample Thickness                                | 6 mm                                                                                                                       | 6 mm                                                            |
| Maximum Sample Size                                     | 280 mm (11") diagonal                                                                                                      |                                                                 |
| Spectral Range                                          | 360 to 830 nm                                                                                                              | 360 to 830 nm                                                   |
| Illumination Spot Size (sample area)                    | 1 mm x 10 µm                                                                                                               | 1 mm x 10 µm                                                    |
| Measurement Speed (typical)                             | < 1500 msec                                                                                                                | < 1500 msec                                                     |
| Calibration Reference Standard                          | Integral BK-7 polished glass                                                                                               | Integral BK-7 polished glass                                    |
| Spectral Reflectance                                    | ± 0.5%                                                                                                                     | ± 0.5%                                                          |
| Tristimulus (CIE 1931 X,Y,Z)                            | ± 0.05                                                                                                                     | ± 0.10                                                          |
| Chromaticity (CIE 1931 x,y)                             | ± 0.005                                                                                                                    | ± 0.005                                                         |
| LAB Color (CIE 1976 L*, a*, b*)                         | L ± 2.0      a*, b* ± 0.8                                                                                                  | L ± 2.0      a*, b* ± 0.8                                       |
| Average Reflectance                                     | ± 0.2                                                                                                                      | ± 0.2                                                           |
| Rotary System Specifications                            |                                                                                                                            |                                                                 |
| 191 Optical Head                                        | 191F-1045 Dual Angle Optics                                                                                                |                                                                 |
| Measurement Locations per Panel                         | 3 measurement locations standard. Configurable up to 5 locations. Configurable for 10 and 45° measurement at any location. |                                                                 |
| Glass Stations                                          | 8 glass stations; 3 for loading / unloading and 5 for measurement optics.                                                  |                                                                 |
| Measurement Cycle Time                                  | < 7 seconds per panel                                                                                                      |                                                                 |
| Sample Load/Unload Cycle Time                           | < 3 seconds per panel, operator dependent                                                                                  |                                                                 |
| Spectral Data                                           | Reflectance as a function of wavelength                                                                                    |                                                                 |
| Colorimetric Data                                       | Tristimulus 1931 X,Y,Z<br>CIE 1976 L*, a*, b*                                                                              | Tristimulus 1964 X,Y,Z<br>CIE 1976 L*, u*, v*      CIE 1931 x,y |
| System Dimensions                                       | 1.75 meters H x 1.6 meters W x 1.6 meters D      Weight 1000 kg                                                            |                                                                 |
| Operating Ranges                                        | Ambient Temperature 0 to 35°C      Relative Humidity < 90% non-condensing                                                  |                                                                 |

Specifications are subject to change without notice.