



Agera[®] Patent #US 11,002,676 B2

Color & Appearance Measurement

HunterLab Innovation, SEE the Difference.

From the world's leading innovator of color and appearance measurement technology, Agera delivers the full picture on your sample's appearance quality.

Offering simultaneous measurements of reflected color, gloss, and image capture in one simple measurement, Agera provides exceptional flexibility, ease-of-use and unprecedented value.

Agera – the ultimate solution for appearance quality control

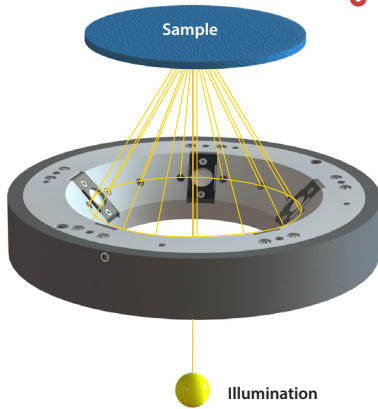


measure
color
the way your
eye sees it



0°/45°c Circumferential Geometry -

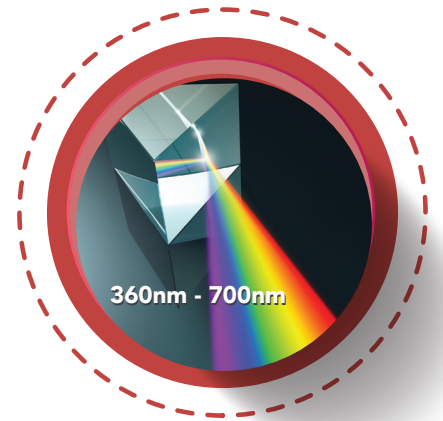
the best assurance for Quality Control



- The **only** optical geometry that replicates how the human eye sees color
- The **only** dual-beam benchtop spectrophotometer that provides this geometry with circumferential viewing to eliminate sample directionality and deliver superior accuracy and consistency

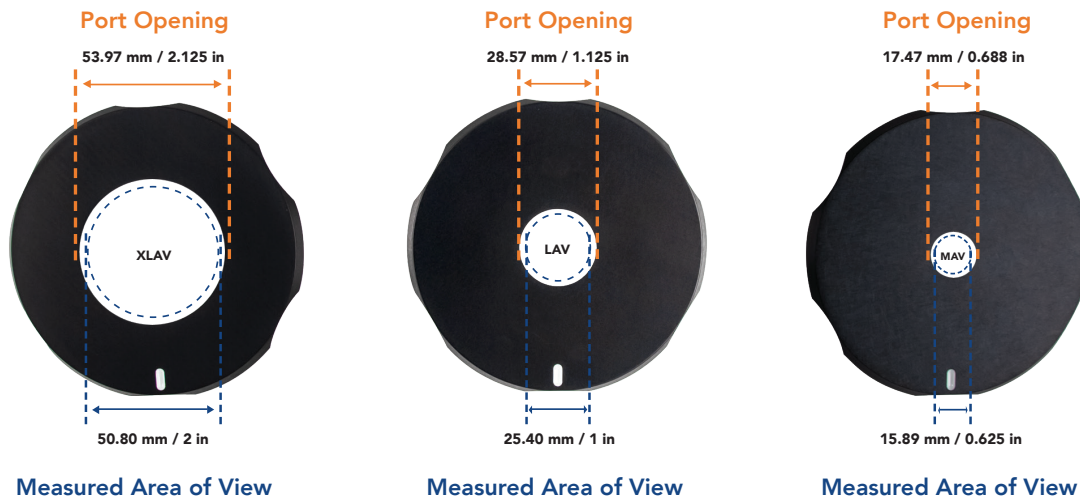
Full Spectrum, Balanced LED Illumination with UV Control

- 360-700nm illumination
- Measure and quantify fluorescent and optically brightened samples
- Factory calibrated UV with user option to calibrate to their specific fluorescent standard
- Simultaneous UV-included and UV-excluded comparative data viewing and reporting



The Largest Fixed-Point Area of View

- Includes Extra-Large, Large and Medium sample port plates
- Extra-Large port plate is the largest fixed-point contact area of measurement in the industry



Port opening vs. Measured Area of View

The Agera port plate openings are oversized by approximately 3.174 mm (1/8 in) so that the illuminated and viewed areas of the sample are clear of the port edges. The measured area of the Agera is controlled by the lenses in the system and not controlled by the port plate opening size. This is an advantage over other instruments in that the port plate does affect the measurement.

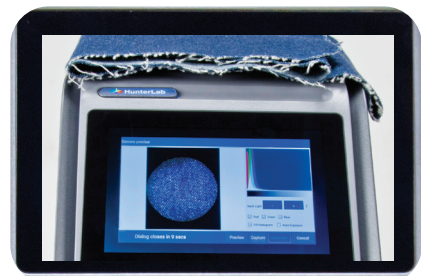
Built-in 60° Gloss Meter

- Provides both color and 60-degree gloss results in a single measurement
- International gloss standard conformance to ASTM D523 and ISO2813 with Certificates of Traceability



Sample Viewing and Image Capture

- Includes built-in 5-megapixel camera with 45-degree, full spectrum, balanced illumination
- Use the live on-screen image for precise sample placement
- Capture and store a true 0-degree field of view sample image as part of the data record
- Recalled images display an RGB histogram for image analysis



Smart User Interface and Data Management - No PC Required

- View measurement results and color graphics on the 7-inch 1280x800 capacitive industrial touchscreen
- Easily communicate data where it needs to go via USB, USB on-the-go, Ethernet, and built-in email



Port up



Port forward



Optional Sample Clamp

EasyMatch Essentials QC Software

- Easily navigate the embedded EasyMatch Essentials Quality Control Software which includes most major scales and indices used in industry
- Configure your specific workflow to streamline software navigation for your application
- Electronic Records option available (for FDA CFR21, Part 11 compliance)

Superior Engineering

- Close Tolerance Spectrophotometer out of the box – no need for additional profiling software
- Protected optics secure your investment – designed to withstand the rigors of harsh environments



HunterLab Remote Access Support Enabled

HunterLab Remote Access Support is a unique network-enabled support tool that enables the HunterLab support team to directly interface with your instrument to perform diagnostics, update instrument software and provide live operator training.



What's in the box - *Everything you need to get it right.*

Standards box includes:

- Calibrated white tile (NIST Certificate of Traceability)
- Green diagnostic tile
- Calibrated black glass used for both color and gloss standardization (ASTM D523, ISO 2813 Certificates of Traceability)

Port Plates:

XL - 53.97 mm (2.125 in), L - 28.57 mm (1.125 in),
M - 17.47 mm (0.688 in)

Power supply (100-240 VAC)



Agera® Reflectance Spectrophotometer



Optional Accessories:

- Sample Clamp
- Gloss Diagnostics Tile
- Glass Sample Cup
- Agera Sample Cup Port Holder Assembly
- UV Standard
- EZMQC Windows based Quality Control Software
- EZMQC-Electronic Records Windows based Quality Control Software (for FDA CFR 21, Part 11 Compliance)
- Ring and Disc Set

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For more information go to www.hunterlab.com
or contact your local HunterLab representative.

SPECIFICATIONS

Agera®

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MEASUREMENT

Measurement Principle:	Dual-beam Reflectance Spectrophotometer / Glossmeter
Geometry Color:	0°/45°c (circumferential) ASTM E1164
Gloss:	60°
Measurement Method:	Port up or Port forward
Read Time:	< 3 sec.
Image Capture:	High-resolution, D65 illuminated, 45°/0° image viewing, image capture and image recall
Port Plate Opening:	Color: XL - 53.97 mm (2.125 in), L - 28.57 mm (1.125 in), M - 17.47 mm (0.688 in)
Area Measured:	Color: XLAV - 50.80 mm (2 in), LAV - 25.40 mm (1 in), MAV - 15.89 mm (0.625 in) Gloss: 8 mm (5/16 in)

TECHNICAL

Illumination Range:	360 nm - 700 nm
Detection Range:	400 nm - 700 nm
Specular Component:	Excluded
Spectral Resolution:	< 3 nm
Effective Bandwidth:	10 nm equivalent triangular
Reporting Interval:	10 nm
Photometric Range:	0 to 150 %
UV Control:	UV Included and UV Excluded with automated comparative data viewing and reporting. Factory calibrated with user option to calibrate to their specific fluorescent standard.
Light Source:	Full spectrum, balanced LED array
LED Life:	5 years typical
Spectrophotometer:	Sealed optics; 256-element diode array; high resolution concave holographic grating

PERFORMANCE

Inter-Instrument Agreement:	Color: $\Delta E_{2000} < 0.20$ CIE $L^*a^*b^*$ (Avg) on CCSII (CERAM) Tile Set Gloss: 0 - 100 ≤ 0.5 GU
Repeatability:	Color: $\Delta E_{2000} < 0.03$ CIE $L^*a^*b^*$ (Max) on white tile Gloss: 0 - 100 GU: ≤ 0.1 GU

USER INTERFACE

Data Views:	EZ View, Color Data Table, Color Plot, Spectral Data, Spectral Plot, Trend Plot
Other Features:	Pass/Fail color indication, time and date stamp, auto-naming, auto-saving, data backup and recovery
Indices and Metrics:	E313 Whiteness Index, Tint, E313 Yellowness Index, D1925 Yellowness Index, Y Brightness, Z%, 457 nm Brightness, Baking Contrast Units, HCCI, SCCA, ASTM E1349, Gloss: ASTM D523, ASTM D2457, ISO 2813, ISO 7668, JIS Z 8741
Color Scales:	CIE L*a*b*, Hunter Lab, CIE L*C*h, CIE Yxy, CIE XYZ
Color Difference Scales:	$\Delta L^*a^*b^*$, ΔLab , ΔL^*C^*h , ΔYxy , ΔXYZ
Color Difference Indices:	ΔE^* , ΔE , ΔC^* , ΔE CMC, ΔE 2000
Data Storage:	8 GB (> 1 million data records with images)
Illuminants:	A, C, D50, D55, D65, D75, F02, F07, F11
Observers:	2° and 10°
Languages:	English, Japanese (German and Simplified Chinese coming soon)
External PC Software:	Compatible with HunterLab EasyMatch QC and EasyMatch QC-Electronic Records Quality Control Software

COMMUNICATIONS I/O

USB OTG:	Connectivity to printer, keyboard, mouse
Front Panel USB:	2.0 bidirectional, data export/import via thumb drive
Ethernet RJ45:	Print directly to standalone or network printers Email directly from the instrument Stream data to LIMS and SPC systems
External Inputs:	Remote Footswitch or similar closed contact switching device
Remote Access Support:	Enabled via internet-based support tool

PHYSICAL / ELECTRICAL

Sensor Dimensions:	Height: 28 cm (11 in) Width: 22 cm (8.75 in) Depth: 31 cm (12.25 in) Weight: 6.35 kg (14 lb)
Display:	Capacitive touch screen, high-resolution color, 17.8 cm (7 in), 1280 x 800
Power:	Input: 100 to 240 VAC, 47 to 63 Hz to universal power supply @ 24 VDC (3.75A 90W)
Operating Environment:	4° to 38° C (40° to 100° F), 10 % to 85 % RH, noncondensing
Storage Environment:	-20° to 65° C (-5° to 150° F), 10 % to 90 % RH, noncondensing
System Components:	• Agera sensor • XL - 53.97 mm (2.125 in), L - 28.57 mm (1.125 in), M - 17.47 mm (0.688 in) port plates • Calibrated white tile (NIST Certificate of Traceability) • Calibrated black glass standard used for both color and gloss standardization (ASTM D523, ISO 2813 Certificates of Traceability) • Green diagnostic tile • 100V - 240V universal power supply • Agera Quick Start Guide • Agera User's Guide on CD

For more information, please contact HunterLab at 703-471-6870, sales@hunterlab.com or visit www.hunterlab.com