



# HunterLab Agera L2 0°/45° Circumferential Geometry

## Visually Correlated Color Measurement for Real-World Materials

### 1. Introduction

Color is one of the most important visual indicators of quality, but it is rarely experienced in isolation. Surface texture, gloss, and grain orientation all influence how color is perceived by the human eye. To accurately reproduce what we see, a spectrophotometer must measure color the same way people do—by capturing light reflected from all directions.

The **HunterLab Agera L2** achieves this through its **0° illumination / 45° circumferential viewing geometry**, where the sample is illuminated perpendicularly and reflected light is collected from a complete 360° circle at 45°. This approach replicates the human visual experience more accurately than any other geometry, eliminating directional bias and ensuring that instrumental readings match what observers perceive.

With its precise optics, uniform illumination, and industry-standard configuration, the Agera L2 sets a new benchmark for visual correlation, repeatability, and appearance-based color control across multiple materials and industries.

### 2. Purpose

The purpose of Agera L2's **0°/45° circumferential geometry** is to **provide true, visually correlated color measurement** across a broad range of materials, especially those whose visual character depends on both color and surface appearance.



In many manufacturing and quality control environments, visual agreement between instrument data and human perception is critical. Conventional  $45^{\circ}/0^{\circ}$  or directional sphere geometries can yield inconsistent results when measuring textured, patterned, or glossy surfaces. The Agera L2's circumferential configuration eliminates these inconsistencies by capturing reflected light uniformly from all viewing angles, regardless of direction or surface irregularity.

This design ensures that **color data, gloss variations, and appearance differences** are faithfully represented, enabling consistent evaluation, tighter process control, and better visual agreement across teams, sites, and global supply chains.

### 3. Why It Matters

In production and quality assurance, even small inconsistencies in color appearance can lead to costly rework, rejected batches, and disputes between suppliers and customers. These issues often stem from differences in geometry—how light is delivered and how reflected light is collected.

Traditional directional instruments measure reflection from a single angle, making results highly sensitive to surface structure or gloss. Two samples may appear identical to the eye but read differently on the instrument. Conversely, two samples that look different may produce the same numeric values.

The Agera L2  $0^{\circ}/45^{\circ}$  circumferential geometry solves this problem by capturing reflected light from **an entire  $360^{\circ}$  ring** around the sample. This ensures that every direction of reflection contributes equally to the measurement—replicating human vision and eliminating bias caused by grain, weave, gloss, or directional texture. The result is **stable, repeatable color data** that correlates directly with visual judgment.



## 4. Technical Overview

The Agera L2's **optical geometry** combines precision-engineered components and advanced illumination control to provide accurate, visually correlated color measurement under all conditions.

### Key Technical Features:

#### 1. 0° Illumination / 45° Circumferential Viewing

- The sample is illuminated perpendicularly (0°), while reflected light is collected from a full circular array at 45°.
- This configuration mimics the human eye's observation of diffuse, ambient light reflection.

#### 2. 360° Reflectance Capture

- By collecting reflected light from all viewing angles, the Agera L2 neutralizes surface-directional effects such as texture, weave, and grain.

#### 3. Gloss-Independent Results

- This geometry minimizes gloss-related distortion, providing accurate readings for matte, semi-gloss, and high-gloss materials without correction factors.

#### 4. Optimized Signal-to-Noise Ratio

- Uniform illumination and sensitive detection ensure high precision and repeatability across sample types—from smooth coatings to rough or structured surfaces.

#### 5. Visual Correlation Assurance

- Color readings align closely with what observers see in daylight or controlled lighting booths, ensuring harmony between instrumental and visual evaluations.



## 5. Applications and Industry Impact

- **Coatings and Paints** - Ensures visual consistency of tone and finish across coatings, paints, and protective finishes, where texture and gloss variation are common.
- **Plastics and Polymers** - Provides accurate color data for molded, extruded, and textured plastic parts used in automotive, packaging, and consumer products.
- **Textiles and Fabrics** - Delivers repeatable measurements for woven, knitted, or printed textiles, minimizing directionality errors from patterns and fibers.
- **Consumer Goods and Appliances** - Enables precise color harmony across multiple components and materials with different surface finishes.
- **Paper and Printing** - Ensures reliable evaluation of coatings, inks, and finishes for packaging, labels, and specialty papers where both gloss and color matter.

## 6. Advantages

- **Visually Correlated Measurements:** Produces results that align with how color is perceived by the human eye.
- **Texture and Gloss Independence:** Eliminates directional bias from surface features or finish variations.
- **Superior Consistency:** Provides repeatable data across operators, materials, and production environments.
- **Appearance-Critical Control:** Ideal for industries where both color and appearance determine quality perception.
- **Cross-Platform Reliability:** Harmonizes readings between laboratory, production, and customer sites for global quality alignment.

## 7. Conclusion



The **HunterLab Agera L2 0°/45° Circumferential Geometry** is the cornerstone of visually correlated color measurement. By capturing reflected light from every direction around the sample, it replicates human visual perception with unmatched accuracy and consistency.

This design eliminates directional bias from texture, gloss, or surface structure—providing **true-to-eye color data** for materials where visual appearance defines product quality. From automotive coatings to textured plastics, from fabrics to finished consumer goods, the Agera L2 ensures that instrumental measurements reflect the way we actually see color—bringing scientific precision and visual reality into perfect alignment.