

Color Measurements

The human eye has a spectral sensitivity that peaks at around 555 nm, which means that the color green gives an impression of higher brightness than other colors. At 490 nm the sensitivity is only 20% compared to the sensitivity at 555 nm. Furthermore, the human eye can only distinguish about 10 million different colors which is actually quite limited relative to the needs of color measurement applications. Spectrometers are designed to measure exact wavelengths, and are therefore ideal for color measurements.

Visible light has a wavelength range of 390-750 nm, so generally color measurement systems are configured to cover the range from 380-780 nm with a spectral resolution of around 5 nm (FWHM).

To facilitate reflective color measurements a reflection probe or integrating sphere is typically required. In either case, a white continuous light source illuminates the surface to be measured and a white reflect-

ive standard tile is needed for calibration. Color measurements may be applied to a variety of industrial applications such as color of textile, paper, fruit, wine, and bird feathers. Avantes has developed a variety

of custom probes to meet the specific demands of the color measurement application. Color measurements are manifested in the L*a*b* color model which includes parameters for brightness and hue.



Color Measurement of Small Areas



This bundle features an AvaSpec-ULS2048CL-EVO spectrometer that is tuned for visible light, which makes it ideal for color measurements. A D65 halogen light source for illumination and a reflection probe (with reflection probe holder) are included as well.

Typical applications:

- In-line reproducibility
- Analysing small spots & lines

Spectrometer	AvaSpec-ULS2048CL-EVO	Grating BB (360-780nm) 200 µm slit AvaSoft-Full & AvaSoft-Color
Light source	AvaLight-HAL-S-Mini	PS-12V/2.08A
Fiber optics	FCR-7UVIR200-2 RPH reflection probe holder	
Included	WS-2 white reflection tile	

Color Measurement of Surfaces



To measure color, wide angle diffused light from a sample is analyzed. This bundle includes a handheld 50 mm integrating sphere and a compact spectrometer. With this bundle, your measurements are free of the gloss-specular component. The measurement optics are placed under a 8° angle (D/8 SPIN).

Typical applications:

- Rough surfaces
- Textile and printed paper
- Fruits

Spectrometer	AvaSpec-ULS2048CL-EVO	Grating BB (360-780nm) 100 µm slit AvaSoft-Full & AvaSoft-Color
Light source	AvaSphere-50-LS-HAL-12V	
Fiber optics	FC-UVIR200-2-ME	
Included	WS-2 white reflection tile	