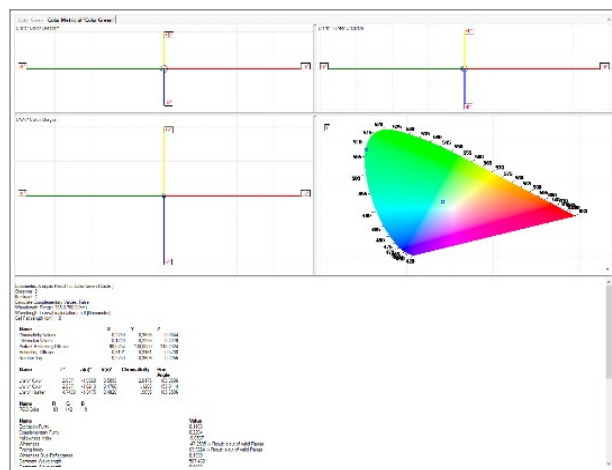


The advanced **Panorama** software is a classic high-end software platform for spectroscopic 2D and 3D data. Coupled with instruments there are perfect capabilities for data analysis.

The Color Add-on module has been designed for UV/Visible spectroscopic data evaluation, including color analysis and color comparison according to several CIE and DIN/ISO standard methods from 2018.

Color analysis is performed within 360 to 830 nm spectral range. Results are displayed in a comprehensive report including meaningful plots of the color spaces. The whole report can be easily transferred into other apps such as Word or Excel.



Data Preparation

Analysis is carried out using UV/Vis spectral data in its original spectral resolution or in either 1, 5, 10 or 20 nm resolutions. Required weighting factors are calculated according to ASTM E2022-16 and E2729-16 from tabulated 1 or 5 nm values.

Standard Observers and Illuminants

Two standard observers are used according to CIE S 014-1:2006 and ISO 11664-1:2007 respectively:

- 2 degrees (CIE 1931)
- 10 degrees (CIE 1964)

Various Illuminants can be used for color analysis, the CIE standard illuminants and also an enhanced set of further well known illuminants:

- **A**
(ISO 11664-2:2007 bzw. CIE S 014-2/E:2006)
Tungsten lamp; color temperature approx. 2856 K
- **D50, D55, D65, D75**
(ISO 11664-2:2007 bzw. CIE S 014-2/E:2006)
Day light illuminants; color temperatures in range 5000-7500 K
- **ID50, ID65** (CIE 184:2009)
Indoor daylight illuminants; color temperatures in range 5000-7500 K
- **C** (CIE 15:2018)
Daylight illuminant; color temperatur approx. 6800 K
- **E** (CIE 15:2018)
Virtual uniform energy illuminant; color temperature approx. 5454 K
- **F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12**
(CIE S014-2/E:2006)
White light of various fluorescent lamps with variable UV fractions
- **Custom Illuminants**
Define your own illuminants by providing simple text files.

Tristimulus values and Color Spaces

Calculation of tristimulus values is the initial step in color analysis according to ASTM E308-18 and CIE 015:2018 respectively. Especially data preparation methods to resolve spectral resolution issues are applied. Tristimulus values are calculated according to CIE S 014-3:2011 and ISO 11664-3:2012 respectively.

Color coordinates are determined for multiple color spaces:

- CIE 1976 Color Space
- L*a*b* Color Space
- L*u*v* Color Space
- Hunter L*a*b* Color Space
- RGB Color Space (24 bit) according to ISO 61966-2-1:2000 and A1:2003

The resulting color parameters are displayed in corresponding plots, and related values are summarized in a comprehensive report. Various standard or custom light sources and the CIE standard observers (2° and 10°) can be adjusted to match required analytical conditions.

Further important Values

- Chromaticity Values
- Hue Angle
- Dominant or Complementary Wavelength
- Whiteness (ASTM E313-15)
- Tinting Index (ASTM E313-15)
- Gardner Index (ISO 4630-2:2004)
- Hazen/APHA/Pt-Co number (ISO 6271:2015)
- Whiteness-Blue Reflection
- Yellowness Index (ASTM E313-15)
- Excitation and Complementary Purity

Need more Information?

Send an email with your request to: color@labcognition.com