

VISION^{lite} ColorCalc Software

Perform color calculations according to common standards with liquid and solid samples

Use your Thermo Scientific™ GENESYS™ 40-180, BioMate 160, or Evolution™ Series Spectrophotometer to calculate L*a*b*, XYZ, APHA and other popular color scales (Table 1). Choose from a range of illuminants and calculate color difference (ΔE) between samples.

Thermo Scientific VISION^{lite}™ ColorCalc Software is a powerful stand-alone software package allowing full instrument and accessory control. VISION^{lite} ColorCalc Software is designed to perform numerous color calculations for a variety of applications including waste water analysis, grading of natural or mineral oils, wine production, and pharmaceutical manufacturing. The software records the required transmission or reflectance spectrum and automatically performs calculations using the recorded data. It can also perform calculations using data acquired by Thermo Scientific VISION^{lite} or INSIGHT™ Pro Software.

Easy setup and operation

The VISION^{lite} ColorCalc interface is easy to configure and operate. Simply set up the scan method, select the calculations you wish to perform from the Calculations menu, and run the method. The software controls the instrument and accessories and automatically performs the calculations on the data upon completion of the scan. Results can be automatically printed or saved. All of the method and calculation parameters are stored with each data file, ensuring complete records and enabling future data evaluation with a few mouse clicks (Figure 1).

Full spectrum color scales and data reporting

VISION^{lite} ColorCalc records the required spectra in transmittance or reflectance and calculates color values for the scales and illuminants shown in (Table 2). 2° and 10° observer angles are available for all scales. Data is reported numerically in a table and can also be presented visually as a color graph for tristimulus color (Figure 2).

Color difference calculation

Color difference calculations (ΔE , δL^* , δa^* , δb^* , δC^* , δh^*) can be performed relative to specified tristimulus (XYZ) and CIE (L*a*b*) color values or relative to a measured spectrum (Figure 3). Difference calculation results are presented numerically and can also be displayed visually as coordinate axes depicting the extents of delta L* and delta a*, b* in L*a*b* colorspace (Figure 4).

◀ Figure 1
Click image
for large view.

▲ Figure 2
Click image
for large view.

▲ Figure 3
Click image
for large view.

▶ Figure 4
Click image for
large view.

Application-specific color scales: Pt-Co/APHA, whiteness, EP color, wine, etc.

The software automates testing according to common color scales. See Table 3 for details.

- Yellowness measurement according to ASTM D1209—the scale variously known as Pt-Co, APHA, or Hazen. Pre-programmed methods are included for use with 1 cm, 5 cm and 10 cm cuvettes so that all data is reported on a common scale. Longer cuvettes are necessary to obtain good data at low Pt-Co values.
- Yellow—red/brown color scales used in the analysis of oils (Gardner, Saybolt and Iodine color)
- A suite of yellowness and whiteness calculations primarily defined in ASTM E313.
- EP (European Pharmacopoeia) color checks are extensively supported (74 distinct calculations)
- Wine color

Sample thickness transformation

When characterizing transparent materials such as bulk glass during processing, it may be necessary to report results that are corrected to scale to a standard sample thickness. The sample thickness recalculation of a spectrum allows correction for actual sample thickness and front surface reflection effects based upon a single value, the material's refractive index, or a full surface reflectance spectrum.

Mathematical calculations and customization

VISION*lite* ColorCalc Software has the ability to perform configurable or custom calculations and to store and present your custom-configured methods on the calculations menu for easy recall and use. The calculations menu can also be customized to show only the tests that you wish to display. Our technical support team can assist in simple customization tasks and more sophisticated calculations can be implemented via a purchased customer special.

Current models

GENESYS 40 and 50	Evolution 201
GENESYS 140 and 150	Evolution 220
GENESYS 180	Evolution 260 Bio
BioMate 160	Evolution 350

Table 1. Compatible Thermo Scientific UV-Vis Spectrophotometers.

Colorspaces	Illuminants
XYZ	A, C, D65
xyY	A, C, D65
L*C*h*	A, C, D65
L*a*b*	A, C, D50, D55, D65, D75, F2, F7, F11
L a b (Hunter)	C, D65

Table 2. Colorspaces and illuminants supported for full spectrum color measurement

Scale or standard calculation	Tests and references
Dominant wavelength	Determines the wavelength of a sample's pure spectral color
Yellowness	ASTM D1925, ASTM E313
Whiteness	CIE 1982, Ganz, ASTM E313
Tint	ASTM E313
Pharm. Eur. Color	Color comparison for EP reference solutions
Pt-Co/APHA/Hazen	ASTM D1209, ISO 6271. 1cm, 5cm and 10cm cells
Gardner	ASTM D1544, ISO 4630
Saybolt	ASTM D156, ASTM D6045
Iodine	ASTM D1981, DIN 6162
ASTM	ASTM D6045, ASTM D1500
Wine color	14 different calculations including <ul style="list-style-type: none"> • Color intensity glories • Color tonality Sudraud • Color intensity red (direct and haze corrected) • Polymeric color ratio • ABS at 420nm, 520 nm and 620 nm • Peak ABS 510 nm-540 nm • Color percentage yellow, red and blue

Table 3. Application specific color scales and calculations supported

Ordering information

Description	Part number
VISION <i>lite</i> ColorCalc Software	869-175600
Interface cable for GENESYS 40-180 and BioMate 160	840-312200

Learn more at thermofisher.com/visionlite