



TORONTECH



LIQUID COLOR SPECTROPHOTOMETER TORONSPEC™ TT-LC2

Liquid Color Spectrophotometer ToronSpec™ TT-LC2 is a versatile spectrophotometer equipped with a heating function, allowing it to operate at temperatures ranging from ambient up to 90°C. This feature makes it suitable for applications requiring temperature-controlled environments. The Liquid Color Spectrophotometer ToronSpec™ TT-LC2 model offers superior repeatability with $\Delta E_{ab} \leq 0.01$, ensuring high precision in color measurements. Its inter-instrument agreement is also very reliable, with a $\Delta E_{ab} < 0.2$, making it a strong choice for settings where multiple instruments are used and consistent performance is required.

APPLICATIONS

The ToronSpec™ TT-LC2 is specifically designed for the high-precision color measurement of liquids that are solid, semi-solid, or highly viscous at ambient temperatures. Its integrated heating function (up to 90°C) provides precise temperature control, eliminating the need for external water baths and ensuring that samples are measured in a consistent, fluid state for maximum accuracy and repeatability.

This temperature-controlled analysis is critical for quality control in:

- **Edible Oils & Fats:** For the essential color grading of products like palm oil, coconut oil, tallow, and shortening, which must be melted to a clear liquid to accurately assess quality and refining levels.
- **Waxes, Resins & Polymers:** To perform quality control on materials like paraffin wax, rosins, and various industrial resins that require heating to a molten state for a true and consistent color measurement.
- **Chemicals & Fatty Acids:** For purity and quality assessment of high-viscosity or solid organic chemicals, such as fatty acids, that must be liquefied at a specific temperature to ensure accurate and repeatable color analysis.
- **Asphalt & Bitumen:** To measure the color of binders and heavy petroleum products at elevated, standardized temperatures, providing a key quality metric related to material sourcing and aging.

TECHNICAL SPECIFICATIONS

Product model	ToronSpec™ TT-LC2	
Measurement condition	d/0 (scattered light source, 0 degree observation angle) (comply with standards: CIE No.15, ISO 7724/1, ASTM E1164, DIN5033 Teil7. JISZ8722Condition c, ASTM D156, ASTM D1500, ASTMD1209, ASTMD5386, ASTMD6045, ASTM D6166, ASTM D1502)	
Stand-alone operation	Support	
Integrating sphere	Φ40mm Avian-D Fully diffuse surface coating	
Lighting source	CLEDS(Full band balanced Led light source)	
Inductor	Dual optical sensor array sensor	
Wavelength range	360-780nm	
Wavelength interval	10nm	
Half-band width	5nm	
Measuring range	0~200%	
Resolution	0.0001	
Observer Angle	2°/10°	
Observation light source	A, B, C, D50, D55, D65, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, CWF, U30, U35, DLF, NBF, TL83, TL84, ID50, ID65, LED-B1, LED-B2, LED-B3, LED-B4, LED-B5, LED-BH1, LED-RGB1, LED-V1, LED-V4	
Display	Pharmacopoeia color number, transmission map/data, sample chromaticity value, color difference value/map, pass/fail result, color deviation, color simulation, historical data color simulation, manual input of standard sample, test report	
Measuring time	≤1.5s	
Measuring optical path	Standard: 10mm glass cuvette, 50mm glass cuvette (optional 33mm and 100mmglass cuvette)	

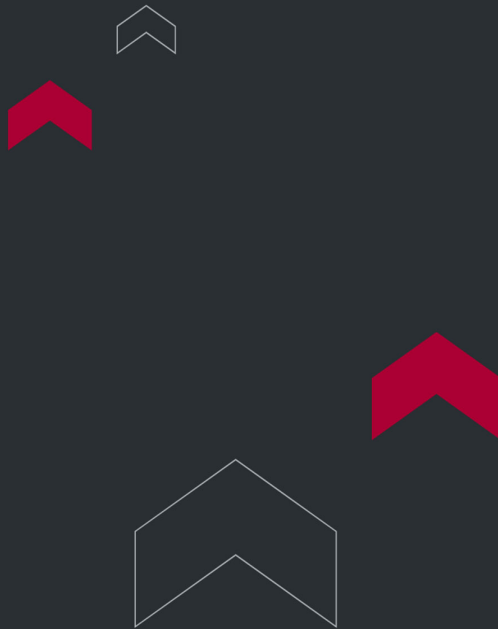
Color space	CIE Lab, LCh, CIE Luv, XYZ, Yxy, Transmissivity, Hunter Lab Munsell, MI, CMYK	
Color difference formula	$\Delta E^*ab, \Delta E^*CH, \Delta E^*uv, \Delta E^*cmc(2:1), \Delta E^*cmc(1:1), \Delta E^*94, \Delta E^*02$	
Other indicators	Pharmacopoeia (European Pharmacopoeia, American Pharmacopoeia) □ WI(ASTM E313-20 □ ASTM E313-73 □ CIE,ISO2470/R457 □ Hunter □ Taube Berger Stensby) □ YI(ASTMD1925 □ ASTM E313-20 □ ASTM E313-73) □ Tint(ASTM E313-20) □ Allochromic index Milm □ APHA □ Hazen,Pt-Co □ Platinum-cobalt index □ Gardner □ Gardner index □ Iron cobalt index □ Saybolt □ Seibert index □ ASTM Color □ EBC □ Beer color □ ICUMSA Color(Sugar chroma)	
Repeatability*	Transmittance: standard deviation≤0.08%Chroma value: $\Delta E^*ab \leq 0.01$ standard deviation, maximum≤0.03	
Inter instrument agreement	$\Delta E^*ab \leq 0.2$	
Heating function	Yes	
Heating temperature range	From ambient temperature to 90℃	
Audit trail	Yes (as required by FDA and CFDA)	
Special function	Intelligent zero calibration	
Screen size	7 inch touch screen	
Store data	Over 100,000 pieces of data	
Software support	ColorExpert, Color QC2	
* After correction, the standard deviation and maximum value of air are measured 30 times at an interval of 5s		

Optional Accessories

Accessories	Photo
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Optional Accessories

100mmCuvette fixture	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
100mmCuvette heat fixture	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
100mmCuvette	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
50mmCuvette	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
33mmCuvette fixture	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
33mmCuvette heat fixture	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
33mmCuvette	Liquid Color Spectrophotometer ToronSpec™ TT-LC2
10mmCuvette	Liquid Color Spectrophotometer ToronSpec™ TT-LC2



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