Lovibond® Tintometer® PFXi-195/1 & PFXi-195/2

- Consistent and reliable color data
- Comprehensive and flexible choice of standard color scales
- Remote upgrade facility for adding scales once in service
- Allows calculation and description of off-hue status
- Gives closest match to stored references
- Generates a customized color scale from reference samples
- Robust design that is easy to operate and maintain
- Includes a glass color standard for conformance checks
- Supplied with color control software for data analysis
- Output conforming to GLP including date, time, sample and user ID
- Accommodates a range of sample cells and tubes

Objective Color Data at an Affordable Price

The Lovibond® PFX*i*-195 is an economical colorimeter for optically clear samples that meets the demand for consistent and reliable color data. It removes all subjectivity involved in color grading, supplying unbiased readings that are unaffected by operator or environment.

Remote Calibration & Maintenance Service via internet (RCMS*i*)
Color measurement instruments need regular checking with calibration standards to ensure correct operation and compliance to established international standards. RCMS*i* is the process in which a number of tightly controlled calibration liquids are measured in a 50 mm cell* via the Calibration function of a PFX*i*. The data is communicated via the internet to a secure server and compared to Master Data. If the data passes within tolerance, then a Certificate of Calibration is e-mailed to the user. This allows The Tintometer Ltd to ensure a PFX*i* instrument is operating correctly and fully calibrated using ISO 17025 certified standards. So, users can be 100% confident that all PFX*i* readings are reliable. In addition, RCMS*i* eliminates the timely and costly need to return equipment to a service center unnecessarily.
Note: Please register before performing your first calibration. Certificates of Calibration are provided post process.
**(Please note 50mm cell must be used when performing RCMSi calibration.)*

Comprehensive Selection of Standard Color Values

PFX*i*-195 colorimeters automatically measure color and display the results directly, either according to the traditional grading scales that have been widely adopted as industry standards for color assessment and control, or in terms of internationally recognized CIE values and spectral data:

Color Scales *	Scope	Range	Resolution
ADMI (full spectrum	American	Colored waters and tinted liquids	

and tristimulus filter)	Standard Methods 2120 E		
ASBC Color		American standard for color grading of beers; derived from EBC Color	1.2 – 10.6 (extended range by dilution and reduction in path length)
ASTM Color	ASTM D1500, D6045,ISO 2049	A wide range of petroleum products including lubricating oils, heating oils and diesel fuel oils	0.5 – 8 units
Chinese Pharmacopoeia Color Series *	CP Appendix IX A	Pharmaceutical solutions	YG1 – 10;Y1 – 10; OY1 – 10; OR1 - 10;BR1 -10
EBC Color	Analytica	Beers, malts and caramels and similarly colored liquids. Based either on absorption at 430 nm or CIE x y chromaticity co-ordinates	2 – 27 units (extended range by dilution and reduction in path length)
European Pharmacopoeia Color Series	Ph. Eur. Method 2.2.2	Pharmaceutical solutions	R1 – 7;Y1 – 7; B1 – 9; BY1 – 7; GY1 – 7
FAC Color	AOCS Cc 13a-43	Approved by the Fats Analysis Committee of the American Oil Chemists Society for grading dark colored oils, fats and tallows.	1 – 45 (odd numbers)
Gardner Color	ASTM D1544, D6166, AOCS Td 1a,	Chemicals and oils ranging from pale yellow to red, such as resins, varnishes, drying oils, lecithins and fatty acids	1 – 18 units
Hess-Ives Color Units	DGK F050.2	Chemicals and surfactant liquids	
Honey Color(Pfund Equivalents)		Commercial honeys, ranging from pale yellow through amber to deep red	
ICUMSA Color	ICUMSA GS1-7, ICUMSA GS2/3-9	Sugar solutions & syrups	
Iodine Color	DIN 6162	Solvents, plasticisers, resins, oils and fatty acids ranging from yellow to brown	1 – 500 units
Klett Color (blue filter KS-42)	AOCS Dd 5-92	Detergents and surfactants	0 – 1000 units
Pt-Co/Hazen/APHA	ASTM D1209	Water and other clear liquids such as	0 – 500 mg Pt/l

Units		plasticisers, solvents and petroleum spirits	
Rosin, US Naval Stores *	ASTM D509	Rosins varying in color from yellow to reddish orange	XC – D + FF
Saybolt Color	ASTM D156, D6045, JIS K 2580	Light colored petroleum products including aviation fuels, kerosene, white mineral oils, hydrocarbon solvents and petroleum waxes	-16 (darkest) to +30 (lightest)
Series 52 (Brown)		Beers, whiskies and sugar solutions	1 – 38 units
Yellowness Index *	ASTM D1925, E 313	Determination of the degree of yellowness under daylight illumination. Calculated from X Y Z tristimulus values	
US Pharmacopoeia Color	USP (631) and Achromicity	Color Pharmaceutical solutions	A – T
CIE Values	ASTM E308	X Y Z tristimulus values; x y Y chromaticity co-ordinates; CIE L*a*b* color space; E color difference; L*C*h color space # , Hunter L a b color space #	Defined by spectrum locus
Spectral data (420 – 710 nm)		Transmittance (full spectrum and at specified wavelengths)	0 – 100%
		Optical density (full spectrum and at specified wavelengths)	0 – 2.5

* These scales are not included on standard instrument versions but are available as a color scale upgrade
# included as standard on PFX*i*-195C only

Versatile and Flexible Application

The Lovibond PFX*i*-195 is configured as a series of industry-focused instruments, each including the principal color scales used in that sector. We supply the following:

Version	Application	Standard Color Scales
PFXi195/1	Liquid chemicals & industrial oils	Pt-Co/Hazen/APHA, Gardner, Iodine, CIE values, spectral data
PFX*i*-195/2	Petroleum oils & fuels	Saybolt, ASTM Color, Pt-Co/Hazen/APHA, CIE values, spectral data

Color scale upgrades give the flexibility to meet individual requirements, enabling additional color scales to be added to standard instrument versions, either at the time of order or remotely once the instrument is in service. For product types that are incompatible with standard color

scales, the PFX*i*-195 allows users to build up a customized scale from a series of reference samples and then to obtain a closest match to the stored references.

Color Testing Made Simple

The Lovibond® PFX*i*-195 is an easy to use, automatic instrument that zeros on air and requires no special skills to operate. The built-in menu guides users through the selection of operating parameters such as color scale. Thereafter, readings are made with a single key press, taking less than 25 seconds to complete.

Easily Customized to User Specifications

Adaptable software and design allow users to configure the PFX*i*-195 to their requirements. Operators can set the language for display, program the PFX*i*-195 to show only those scales of interest or restrict access to the menu system. As well as standard colorimetry cells, the PFX*i*-195 can be used with a range of tubes and standard, flow-through and disposable spectrophotometer cells.

Calculation and Description of Off-Hue Status

The PFX*i*-195 off-hue status is a useful facility that reveals whether the sample color is characteristic of the selected scale. It includes a description of hue difference (eg. redder, greener), relative saturation (stronger or weaker) and an off-hue factor (a relative measure of the distance away in color space of the sample color from the ‘true’ color scale).

Suited to Laboratory or Production Environments

Comprehensive facilities for color management make the Lovibond® PFX*i*-195 an ideal choice for the laboratory. However, with excellent calibration stability, password protection for tamper proof control and simple operation, the PFX*i*-195 also supports the migration of quality control to the manufacturing area, making it a cost-effective option for dedicated production testing. For easy maintenance, the Lovibond® PFX*i*-195 includes a robust steel sample chamber, which is simply removed and cleaned if a spillage occurs, and the precision filament lamp is easily assessed and changed from outside the instrument.

Optimized Use of Color Data

Data sets can be saved in the instrument, printed out or automatically down loaded to a PC computer where they can be processed and stored for future analysis, traceability and monitoring trends. The color control software supplied with the PFX*i*-195 enables the generation of spectral and CIE diagrams as well as analysis of spectral data. It also permits direct control of the instrument from the computer.

Confidence in Color Measurement

For regular conformance checking each PFX*i*-195 is provided with a calibrated glass filter of known color value. Sets of conformance filters and certified color reference solutions are also available for routine calibration and verification of test data. Conformance filters are sup-plied with a Certificate of Conformity stating their color values and confirming that they have been manufactured and inspected under the control of Tintometer's® ISO 9001 quality system. Certified color ref-erence solutions are supplied with full traceability to internationally recognized standards, either UKAS to ISO/IEC 17025:2000 (ASTM Color, Saybolt and Gardner Color) or the ISO 9001:2000 quality sys-tem (Pt-Co Units).

Color Analysis made Simple

The PFX*i*-880/IP17 colorimeter is an easy to use, automatic instrument. The menu system guides operators through the selection of operating parameters. Thereafter, measurements are initiated by just a single key press and take less than 25 seconds to complete. When measuring IP Units of clear, water-white products, the long sample path length ensures precise color measurements, without multiplying errors.

Confidence in Instrument Performance

The PFX*i*-880/IP17 is a rugged colorimeter with a fabricated steel housing which is designed to function equally as a QC instrument within the laboratory or on 24 hour operation in a production environment. A diagnostic test routine allows users to conduct periodic checks on the instrument or identify faults. For regular conformance testing the colorimeters are also supplied with a colored glass filter from the appropriate color scale.

Optional Items for Individual Applications

Integrated heater unit
A factory fitted option to prevent heated samples such as waxes from solidifying in the cell.
Windows software for data capture on PC
Allows data sets to be automatically downloaded to a PC computer where they can be processed or stored.
Conformance filter sets
For quick and simple conformance checks, sets of graded glass filters, representing a spread of colors from the Lovibond® RYBN Color scale or IP Units, are available.
Certified colour reference standards
Ideal for routine calibration and verification of test data.

TECHNICAL SPECIFICATION

Measuring principle	9 interference filters
Spectral response	420 – 710 nm

Bandwidth	20 nm
Repeatability	
- chromaticity (x y)	± 0.0004
- transmittance	± 0.5 %
Measurement time	Less than 25 seconds
Calibration	Single key press; fully automated
Light source	5 Volt, 10 Watt tungsten halogen lamp (lens ended)
Illuminant	CIA Illuminant A, C, D65
Observer	2° 10°
Path length	0.1 – 50 mm
Interface	Parallel printer port, RS 232 port
Data Storage	Up to 32 data sets
Input voltage	Universal (190 – 240V), via external power supply
Approvals	CE
Display	2 x 40-character, back-lit LCD
Keypad	21-key membrane keypad; washable polyester with audible feedback
Instructions	7 languages: English, French, German, Spanish, Italian, Portuguese, Dutch
Instrument housing	Fabricated sheet steel with tough, textured paint finish
Dimensions	Width 515mm, depth 195mm, height 170mm
Weight	6.8 kg

Each PFX*i*-195 is supplied complete with Windows software, optical glass cells for the color scales included, a certified glass filter of specified color value for regular con-conformance testing, a spare lamp and instructions.