

# Lovibond® Colour Measurement

Tintometer® Group



## TR 520 / 500 Spectrophotometer



- Compact, ergonomic design for comfortable handling and fingertip control
- Intuitive icon-based display for fast and easy operation
- Robust construction for a long life in both production and laboratory environments
- Specially designed accessories for a wide range of materials including powder, liquid, gel, paste, granules and solid material
- On-board camera-based locator makes it easy to see what you are measuring for repeatable, stable results
- Measure large or small area views with easy interchangeability
- Set customised parameters for quality control
- Free OnShade PC-based software which allows graphs, statistical process control, shade searching, all available colour, space, colour differences and indices
- **Bluetooth®** connectivity where available
- Measure fluorescent materials with UV in and UV out
- Multiple language support

### Market sectors

Coatings

Food and Beverage

Household Products

Medical and Clinical

Plastics



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TR 520 / 500 Accessories



Specially designed accessories for a wide range of materials including powder, liquid, gel, paste, granules and solid material

| Specifications                | TR 520                                                                                                                                                                     | TR 500                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Optical Geometry              | Reflect: di: 8°, de: 8° (diffused illumination, 8 degree viewing angle)                                                                                                    |                                       |
| Integrating Sphere Size       | 48mm                                                                                                                                                                       |                                       |
| Light Source                  | Combined LED Light, UV Light                                                                                                                                               | Combined LED Light                    |
| Spectrophotometric Mode       | Concave Grating                                                                                                                                                            |                                       |
| Sensor                        | 256 image Element Double Array CMOS Image Sensor                                                                                                                           |                                       |
| Wavelength Range              | 400-700nm                                                                                                                                                                  |                                       |
| Wavelength Interval           | 10nm                                                                                                                                                                       |                                       |
| Semiband Width                | 10nm                                                                                                                                                                       |                                       |
| Measured Reflectance Range    | 0-200%                                                                                                                                                                     |                                       |
| Measuring Aperture            | Dual Aperture: 10mm/8mm & 5mm/4mm                                                                                                                                          | Customized Aperture: 8mm/4mm/1x3mm    |
| Specular Component            | SCI & SCE                                                                                                                                                                  |                                       |
| Colour Space                  | CIE Lab, XYZ, Yxy, LCh, CIE LUV, Hunter Lab                                                                                                                                |                                       |
| Colour Difference Formular    | $\Delta E^*_{ab}$ , $\Delta E^*_{uv}$ , $\Delta E^*_{94}$ , $\Delta E^*_{cmc}$ (2:1), $\Delta E^*_{cmc}$ (1:1), $\Delta E^*_{00v}$ , $\Delta E$ (Hunter)                   |                                       |
| Other Colorimetric Index      | WI (ASTM E313, CIE/ISO, AATCC, Hunter) YI (ASTM D1925, ASTM 313, TI (ASTM E313, CIE/ISO) Metamerism Index MI, Staining Fastness, Colour Fastness, Colour Strength, Opacity |                                       |
| Observer Angle                | 2° / 10°                                                                                                                                                                   |                                       |
| Illuminant                    | D65, A, C, D50, D55, D75, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12                                                                                                | D65, A, C, D50, D55, D75, F2, F7, F11 |
| Displayed Data                | Spectrogram/Values, Samples Chromaticity Values, Colour Difference Values/Graph, PASS/FAIL Result, Colour Offset                                                           |                                       |
| Measuring Time                | 2.6s                                                                                                                                                                       |                                       |
| Repeatability                 | MAV/SCI: $\Delta E^* \leq 0.03$                                                                                                                                            | MAV/SCI: $\Delta E^* \leq 0.05$       |
| Inter-Instrument Agreement    | MAV/SCI: $\Delta E^* \leq 0.15$                                                                                                                                            | MAV/SCI: $\Delta E^* \leq 0.2$        |
| Measurement Mode              | Single Measurement, Average Measurement                                                                                                                                    |                                       |
| Locating Method               | Camera View Finder Locating                                                                                                                                                |                                       |
| Battery                       | Li-ion battery. 5000 measurements with 8 hours                                                                                                                             |                                       |
| Dimensions                    | 184mm L x 77mm W x 105mm H                                                                                                                                                 |                                       |
| Weight                        | 600g                                                                                                                                                                       |                                       |
| Illuminant Life Span          | 5 years, more than 3 million measurements                                                                                                                                  |                                       |
| Display                       | 3.5 inch TFT colour LCD, Capacitive Touch Screen                                                                                                                           |                                       |
| Data Port                     | USB, Bluetooth® 4.0                                                                                                                                                        |                                       |
| Data Storage                  | 2000 Standards : 20000 Samples                                                                                                                                             |                                       |
| Languages                     | English, French, German, Spanish, Portuguese, Chinese                                                                                                                      |                                       |
| Operating Environment         | 0~40°C, 0~85° Relative Humidity (non condensing), Altitude < 2000m                                                                                                         |                                       |
| Storage Environment           | -20~50°C, 0~85° Relative Humidity (non condensing)                                                                                                                         |                                       |
| Standard Accessories Included | PC OnShade Software, White & Black Calibration Cavity, Power Adapter, Built-in Li-ion Battery, User Guide                                                                  |                                       |
| Optional Accessories          | Micro Printer, TR Accessory (for Liquids, Powers and Gels)                                                                                                                 |                                       |

| Order No | Product                       | Order No | Product                   |
|----------|-------------------------------|----------|---------------------------|
| 403035   | TR 520 (8mm and 4mm Aperture) | 403042   | TR 500 (1 x 3mm Aperture) |
| 403040   | TR 500 (8mm Aperture)         | 403225   | TRA 520                   |
| 403041   | TR 500 (4mm Aperture)         | 403220   | TRA 500                   |

[www.lovibond.com](http://www.lovibond.com)

[sales@tintometer.com](mailto:sales@tintometer.com)

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|                                                                                |                                                                               |                                                                                           |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>The Tintometer Ltd</b><br>T: +44 (0)1980 664800<br>F: +44 (0)1980 625412    | <b>Tintometer Inc</b><br>T: +1 941 756 6410<br>F: + 1941 727 9654             | <b>Tintometer GmbH</b><br>T: +49 (0) 231/94510-0<br>F: +49 (0) 231/94510-20               |
| <b>Tintometer – China</b><br>T: +86 10 8525 1111 Ext 330<br>F: +86 10 85251001 | <b>Tintometer – South East Asia</b><br>T: +603 3325 2286<br>F: +603 3325 2287 | <b>Tintometer India Pvt. Ltd</b><br>T: +91 (0) 40-23883300<br>Toll Free: 1800 599 3891/92 |

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# Lovibond® Colour Measurement Tintometer® Group



## TR 500 Spectrophotometer

Entry Level Reflectance Meter with Customized Aperture: 8mm/4mm/1x3mm



- Intuitive On-board Icon-based Software
- Easy To Follow On-board Instructions
- Free OnShade PC-based Software for Graphs and Statistical Process Control
- Ergonomic Design for Prolonged Use

Part Number: 403040

### Suitable for Use Over Prolonged Periods

The TR 500 has been designed with ergonomic features making it easy to handle during prolonged use.

### Latest Technology Facilitates Use

Measurements are further facilitated with touch screen technology and the intuitive on-board icon-based software which guides you to customise your instrument including, but not limited to: select your language option (English, French, German, Spanish, Portuguese or Chinese); chose between right handed or left handed operation; switch light source and colour space. The on-screen interface also guides you through the process of sample measurement and data management.

### Enhanced Flexibility

Flexibility is also enhanced with the instrument's choice of customised aperture (8mm/4mm/1 x 3mm) and accessories for most applications including powders, liquids, gels, pastes, granules and solid materials.

### Repeatable, Stable Results

To ensure you can easily see what you are measuring for repeatable, stable results, the TR 500 incorporates an on-board camera-based locator.

### View Results On-Screen or On PC

As standard, the TR 500 is supplied with a free copy of OnShade software to view the results on a PC (via USB cable) and develop graphs, statistical process control, shade searching and all available Colour, Space, Colour Differences and Indices which can be shared or printed (via the optional micro printer accessory).

### Guaranteed Calibration

White and black calibration tiles are, naturally, included with the instrument. It is recommended to re-calibrate every 24 hours minimum.

### Suitable for Multiple Applications

The TR 500 reports CIE Lab, XYZ, Yxy, LCh, CIE LUV, Hunter Lab colour spaces,  $\Delta E^*L^*a^*b^*$ ,  $\Delta E^*C^*h^*$ ,  $\Delta E^*uv$ ,  $\Delta E^*94$ ,  $\Delta E^*cmc(2:1)$ ,  $\Delta E^*cmc(1:1)$ ,  $\Delta E^*00$ ,  $\Delta E$  Hunter Colour Difference Formulas; and can be set to D65, A, C, D50, D55, D75, F2, F7 & F11 illuminants. In addition, the TR 500 can report a wide selection of other Colorimetric Index's: WI (ASTM E313, CIE/ISO, AATCC, Hunter), YI (ASTM D1925, ASTM 313), TI (ASTM, E313, CIE/ISO), Metamerism Index (MI), Colour stain, Colour Fastness, Colour Strength and Opacity.

This data is displayed as Spectral Value/ Graph, Colorimetric Value, Colour Difference Value/ Graph, PASS/FAIL Result, Colour Offset or Samples Chromaticity values.

### TR 500 Spectrophotometer

An entry level yet ergonomic and flexible reflectance spectrophotometer with customised apertures of 8mm/4mm/1 x 3mm. Touch screen technology with intuitive icons to enable user-specific settings and guide through the measurement process. An on-board camera-based locator and black and white calibration plates ensure accurate measurements and results every time. Multi language support for international use.

Technical Data

|                            |                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Colour Type                | Opaque                                                                                                                                                                                                                                                                                                                                                                                      |
| Optical Geometry           | Reflect: di: 8°, de: 8° (diffused illumination, 8 degree viewing angle)                                                                                                                                                                                                                                                                                                                     |
| Integrating Sphere Size    | 48 mm                                                                                                                                                                                                                                                                                                                                                                                       |
| Spectrophotometric Mode    | Concave Grating                                                                                                                                                                                                                                                                                                                                                                             |
| Sensor                     | 256 image Element Double Array CMOS Image Sensor                                                                                                                                                                                                                                                                                                                                            |
| Display                    | 3.5 inch TFT colour LCD, Capacitive Touch Screen                                                                                                                                                                                                                                                                                                                                            |
| Interfaces                 | USB<br>Bluetooth 4.0                                                                                                                                                                                                                                                                                                                                                                        |
| Spectral Interval          | 10 nm                                                                                                                                                                                                                                                                                                                                                                                       |
| External Storage           | 2000 Standards : 20000 Samples                                                                                                                                                                                                                                                                                                                                                              |
| Measurement Mode           | Single Measurement, Average Measurement                                                                                                                                                                                                                                                                                                                                                     |
| Power Supply               | Li-ion Battery                                                                                                                                                                                                                                                                                                                                                                              |
| Battery Life Time          | 5000 measurements with 8 hours                                                                                                                                                                                                                                                                                                                                                              |
| Location Method            | Camera View Finder Locating                                                                                                                                                                                                                                                                                                                                                                 |
| Measured Reflectance Range | 0 - 200 %                                                                                                                                                                                                                                                                                                                                                                                   |
| Measurement Time           | 2.6 s                                                                                                                                                                                                                                                                                                                                                                                       |
| Measuring Aperture         | Customized Aperture: 8mm/4mm & 1x3mm                                                                                                                                                                                                                                                                                                                                                        |
| Specular Component         | SCI & SCE                                                                                                                                                                                                                                                                                                                                                                                   |
| Colour Difference Formular | $\Delta E^*ab$ , $\Delta E^*uv$ , $\Delta E^*94$ , $\Delta E^*cmc$ (2:1), $\Delta E^*cmc$ (1:1), $\Delta E^*00v$ , $\Delta E$ (Hunter)                                                                                                                                                                                                                                                      |
| Other Colorimetric Index   | WI (ASTM E313, CIE/ISO, AATCC, Hunter)<br>YI (ASTM D1925, ASTM 313, TI (ASTM E313, CIE/ISO)<br>Metamerism Index MI, Staining Fastness, Colour Fastness, Colour Strength, Opacity                                                                                                                                                                                                            |
| Displayed Data             | Spectrogram/Values, Samples Chromaticity Values, Colour Difference Values/Graph, PASS/FAIL Result, Colour Offset                                                                                                                                                                                                                                                                            |
| Inter Instrument Agreement | MAV/SCI: $\Delta E^* \leq 0.2$                                                                                                                                                                                                                                                                                                                                                              |
| Spectral Range             | 400 - 700 nm                                                                                                                                                                                                                                                                                                                                                                                |
| Bandwidth                  | 10 nm                                                                                                                                                                                                                                                                                                                                                                                       |
| Repeatability              | MAV/SCI: $\Delta E^* \leq 0.05$                                                                                                                                                                                                                                                                                                                                                             |
| Illuminants                | CIE Illuminant D65<br>CIE Illuminant A<br>CIE Illuminant C<br>CIE Illuminant D50<br>CIE Illuminant D55<br>CIE Illuminant D75<br>CIE Illuminant F1<br>CIE Illuminant F2<br>CIE Illuminant F3<br>CIE Illuminant F4<br>CIE Illuminant F5<br>CIE Illuminant F6<br>CIE Illuminant F7<br>CIE Illuminant F8<br>CIE Illuminant F9<br>CIE Illuminant F10<br>CIE Illuminant F11<br>CIE Illuminant F12 |
| Portability                | Portable                                                                                                                                                                                                                                                                                                                                                                                    |
| Illuminant Life Span       | 5 years, more than 3 million measurements                                                                                                                                                                                                                                                                                                                                                   |
| Observer                   | 2° / 10°                                                                                                                                                                                                                                                                                                                                                                                    |
| Environmental Conditions   | 0 - 40 °C, 0 - 85 % Relative Humidity (non condensing), Altitude < 2000 m                                                                                                                                                                                                                                                                                                                   |
| Stock Conditions           | -20 - 50 °C, 0 - 85 % Relative Humidity (non condensing)                                                                                                                                                                                                                                                                                                                                    |
| Languages User Interface   | English, German, French, Spanish, Portuguese, Chinese                                                                                                                                                                                                                                                                                                                                       |
| Dimensions                 | 184 x 105 x 77 mm                                                                                                                                                                                                                                                                                                                                                                           |
| Weight                     | 600 g                                                                                                                                                                                                                                                                                                                                                                                       |

Delivery Scope

- TR 500 Handheld, Sphere Spectrophotometer
- OnShade PC Software
- White and Black Calibration Board (white tile and black port)
- Dust Cover
- USB Cable
- External DC Power Supply
- USB Stick with User Manuals in English, French, German, Spanish, Portuguese and Chinese
- Sturdy Carrying Case
- Optional Accessory**
- Micro printer (to be purchased separately)

**Tintometer GmbH**

Lovibond® Water Testing  
Schleefstraße 8-12  
44287 Dortmund  
Tel.: +49 (0)231/94510-0  
Fax: +49 (0)231/94510-30  
sales@lovibond.com  
www.lovibond.com  
Germany

**Tintometer China**

Room 1001, China Life Tower  
16 Chaoyangmenwai Avenue,  
Beijing, 100020  
Tel.: +86 10 85251111 App. 330  
Fax: +86 10 85251001  
chinaoffice@tintometer.com  
www.lovibond.com  
China

**Tintometer Inc.**

6456 Parkland Drive  
Sarasota, FL 34243  
Tel: 941.756.6410  
Fax: 941.727.9654  
sales@lovibond.us  
www.lovibond.com  
USA

**The Tintometer Limited**

Lovibond House  
Sun Rise Way  
Amesbury, SP4 7GR  
Tel.: +44 (0)1980 664800  
Fax: +44 (0)1980 625412  
sales@lovibond.uk  
www.lovibond.com  
UK

**Tintometer South East Asia**

Unit B-3-12, BBT One Boulevard,  
Lebuh Nilam 2, Bandar Bukit Tinggi,  
Klang, 41200, Selangor D.E  
Tel.: +60 (0)3 3325 2285/6  
Fax: +60 (0)3 3325 2287  
lovibond.asia@tintometer.com  
www.lovibond.com  
Malaysia

**Tintometer India Pvt. Ltd.**

Door No: 7-2-C-14, 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> Floor  
Sanathnagar Industrial Estate,  
Hyderabad, 500018  
Telangana  
Tel: +91 (0) 40 23883300  
Toll Free: 1 800 599 3891/ 3892  
indiaoffice@tintometer.com  
www.lovibondwater.in  
India

**Tintometer AG**

Hauptstraße 2  
5212 Hausen AG  
Tel.: +41 (0)56/4422829  
Fax: +41 (0)56/4424121  
info@tintometer.ch  
www.tintometer.ch  
Switzerland

**Tintometer Brazil**

Caixa Postal: 271  
CEP: 13201-970  
Jundiaí – SP  
Tel.: +55 (11) 3230-6410  
sales@tintometer.com.br  
www.lovibond.com.br  
Brazil

**Tintometer Spain**

Postbox: 24047  
08080 Barcelona  
Tel.: +34 661 606 770  
sales@tintometer.es  
www.lovibond.com  
Spain

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