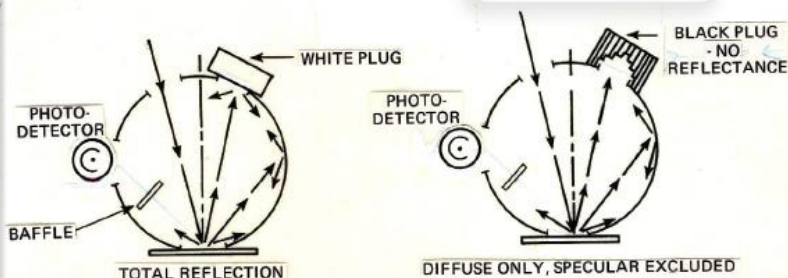


Measurement Method

MM 5219.00



Measuring Vegetable Oils with Vista

Color is often used as an indication of quality and consistency for vegetable oil. This attribute used for the commercial classification of vegetable and other edible oils for their quality. Consumers rely on color for acceptability and Vista provides the right color measurement solution to meet the quality standards of visual perception.

Throughout the production process, quantitative color values accurately evaluate the quality of vegetable oil products.



HunterLab's Vista transmittance spectrophotometer offers a modern approach to the color measurement of vegetable oils that is both fast, accurate, and unique. The Vista measurement method uses the LOVIBOND® and AOCS color indices, popular for classifying Vegetable oil color. Rather than requiring the use of expensive and hard to clean 1-in or 5.25-in transmission cells, it enables small quantity sample measurements in inexpensive transmittance cells and vials. Sizes such as 10mm, 20mm 24mm, 33mm or 50mm can be used to accurately report the LOVIBOND® RYBN and AOCS results in either 1-in or 5.25-in standard cell pathlengths.

The Application

HunterLab's implementation of LOVIBOND®/AOCS color scales are derived from the standard methods AOCS Cc 13e/BS 684-1.14, and AOCS Cc 13b, and based on the original work done by the National Institute of Standards Technology (NIST). The results show precise reporting of LOVIBOND® Color in a modern spectrophotometer that provides fast and reliable color information. LOVIBOND® RY is implemented in Essentials version release 21 and higher. LOVIBOND® RYBN is implemented in Essentials Rev79 and higher.

HunterLab has extended the Vista transmittance spectrophotometer's value by providing flexible measurement and reporting parameters. In the Essentials software, both the cell pathlength measured and the cell pathlength are displayed side by side. The user can measure their samples using a variety of standard cell pathlengths and accurately report the calculated 1-in or 5.25-in LOVIBOND®/AOCS values. The precision provided by Vista permits a cell pathlength as small as 10mm to measure the difficult light-colored oils, and accurately report LOVIBOND®/AOCS 5.25-in pathlength values. With only 5 seconds per measurement, the Vista improves productivity and requires less sample material and less time on post-measurement cleaning.

Since the cell pathlength/type is flexible for Vista to measure LOVIBOND/AOCS, there are many different sample holder options for this application.

Recommended Parameters:

Color Scale	CIE L*a*b* as a full color descriptor
Indices	LOVIBOND® RYBN, LOVIBOND® RY, or AOCS RY
Illuminant/Observer	C/2
Vista Essentials Version	1.06.0021 and higher for LOVIBOND® RY
	1.06.0079 and higher for LOVIBOND® RYBN
Accessories	
D02-1017-193	Self-Centering Base Plate
04-4592-00	20mm Large Format Glass Rectangular Cell

Measurement Method-Standalone (Using Vista Essentials)

1. **Configure Essentials** to Measure and Report Lovibond®/AOCS value.
The following is an example using 20 mm flat sample cell and reporting LOVIBOND® RY at 133.35 mm (5.25-in).

- a. From **WORKSPACE > COLOR SCALES**, select **CUSTOM INDICES** button.

Color Scale	Ill/Obs	Indices	Differences
ADMI-10mm [C/2]		☐	
ADMI-50mm [C/2]		☐	
AOCs R [C/2]		☐	
AOCs Y [C/2]		☐	
APHA-10mm [C/2]		☐	
APHA-20mm [C/2]		☐	

☐ Show Difference Indices

Clear All Custom Indices

Defaults Apply Cancel

Select Custom Indices

- b. In **CUSTOM INDICES** dialog, select **LOVIBOND**.

Custom Indices

Select Indices

APHA

Path Length (mm) 10

Add >>

<< Remove

Transmittance (T%)

Absorbance (A)

WaveLength(nm) 400

Adjust Scale Factors :

Lovibond AOCs ICUMSA 420 ICUMSA 560

Apply Close

Select Lovibond®

- c. Enter the **ILL/OBS** and **CELL PATHLENGTH** (mm) that will be used.

Custom Indices

Select Indices

APHA

Path Length (mm) 10

Add >>

<< Remove

Transmittance (T%)

Absorbance (A)

WaveLength(nm) 400

Adjust Scale Factors :

Lovibond®

Ill/Obs C/2

*Cell pathlength (mm) 20

*Report pathlength 133.35mm (5.25")

RY RYBN

Save Close

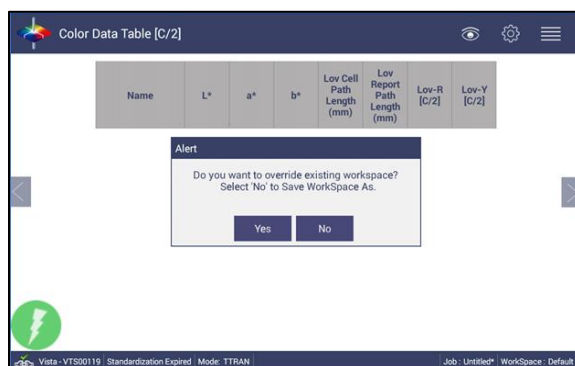
Apply Close

Enter Lovibond® Parameters

Note: The cell pathlength number must be from 0 to 100 with maximum one decimal.

- d. Select the **REPORT PATH LENGTH** for the output desired. As a suggestion, use **1-inch** for very dark samples and **5.25-inch** for light samples. Please select corresponding radio button to report **LOVIBOND® RY** or **LOVIBOND® RYBN**. Click **SAVE** to go back to Indices tab.

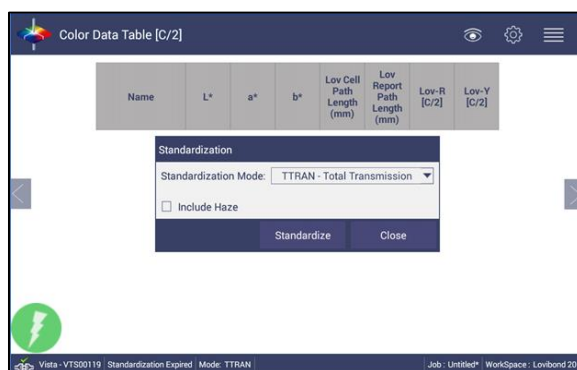
- e. From the **WORKSPACE > COLOR SCALES > INDICES** tab, select the **LOVIBOND® R** and **Y** indices and click **APPLY**. The LOVIBOND R, Y, cell pathlength and report pathlength will be shown in Color Data View.
- f. To save the above setup for future use, click **WORKSPACE > SAVE WORKSPACE**. When prompted to Save, select **NO** to create a new Workspace Name. Enter the **NAME** of the Workspace such as, **Lovibond & (cell pathlength)**.



Naming the Workspace

2. Standardization.

- a. Fill DI Water in 20mm flat cell and place it to the sphere side in Vista compartment.
- b. Click the **STANDARDIZE** button at the bottom of Essentials screen. Select **TTRAN** mode for Standardization and measurements. Press **STANDARDIZE** to continue.



Standardize in TTRAN

- c. After standardization is done, take a sample measurement of DI water. Make sure that you can read the DI water as $L^* = 100$, $a^* = 0$, $b^* = 0$, LOVIBOND® R = 0, LOVIBOND® Y = 0.

Note: If you would like to measure Haze for oils, please check Haze in standardization dialog as well.

Note: Standardization is required when changing cell path lengths or if the standardization interval has expired.

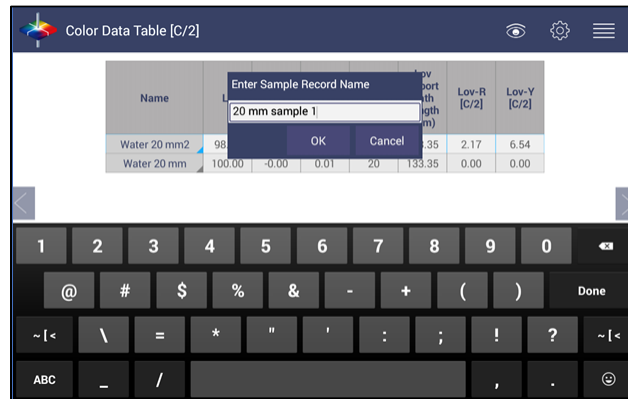
*Completed Standardization*

3. **Sample Measurement.** Empty cell, dry, and fill with desired sample to measure.

*Sample at the TTRAN Port*

- a. **READ** the sample and enter the desired sample name. You may wish to include the cell pathlength as part of the name i.e. "20mm sample1". Since you can always change the cell/report pathlength value through LOVIBOND® configuration, it is necessary to know what true cell pathlength was used to measure this sample.

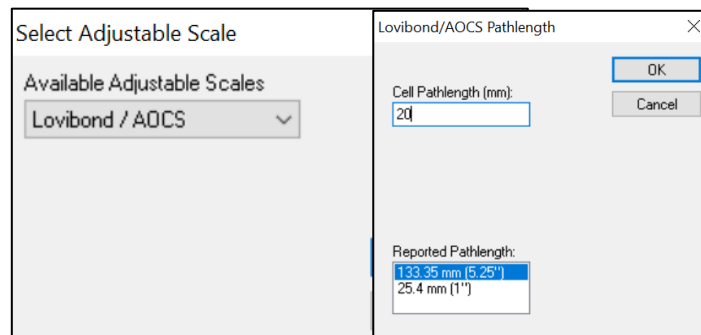
*Sample Results*



Sample Naming

Measurement Method-Connect to EasyMatch QC

1. **Connect Vista with EasyMatch QC.** Please check the methods on how to connect Vista with EasyMatch QC in [this article at our support website](#).
 2. **Configure EasyMatch QC** to measure and report Lovibond®/AOCS values. The following is an example using 20 mm flat sample cell and reporting LOVIBOND®RY at 133.35 mm (5.25-in).
- a. In EasyMatch QC, go to **OPTIONS > ADJUST SCALE FACTORS**, select **LOVIBOND®/AOCS** and then configure the **CELL PATHLENGTH** and **REPORTED PATH LENGTH**.



Adding Lovibond®

- b. In EasyMatch QC, right click on the **COLOR DATA TABLE** view and select **CONFIGURE**, add **LOVIBOND** into Color Data Table view.

3. Standardize.

- a. Fill DI Water in 20mm flat cell and place it to the sphere side in Vista compartment.
- b. **SELECT SENSOR > CONFIGURE > SET MODES** and select **TTRAN** mode. Then **STANDARDIZE** in EasyMatch QC.
- c. After standardization is done, take a sample measurement of DI water. Make sure that you can read the DI water as $L^* = 100$, $a^* = 0$, $b^* = 0$, LOVIBOND® R = 0, LOVIBOND® Y = 0.

Note: If you would like to measure Haze for oils, please check Haze in standardization dialog as well.

Note: Standardization is required when changing cell path lengths or if the standardization interval has expired.

4. **Measure Samples.** Empty cell, dry, and fill with desired sample. Read the sample and enter the sample name. You may wish to include the cell pathlength as part of the name, i.e. "20mm sample1". Since you can always change the cell/report pathlength value through LOVIBOND®/AOCS configuration, it is necessary to know what true cell pathlength was used to measure this sample.

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About HunterLab

HunterLab, the first name in color measurement, provides ruggedly dependable, consistently accurate, and cost effective color measurement solutions. With over 6 decades of experience in more than 65 countries, HunterLab applies leading edge technology to measure and communicate color simply and effectively. The company offers both diffuse/8° and a complete line of true 45°/0° optical geometry instruments in portable, bench-top and production in-line configurations. HunterLab, the world's true measure of color.

LOVIBOND® is a registered trademark of The Tintometer Ltd., UK

