

Measurement Method

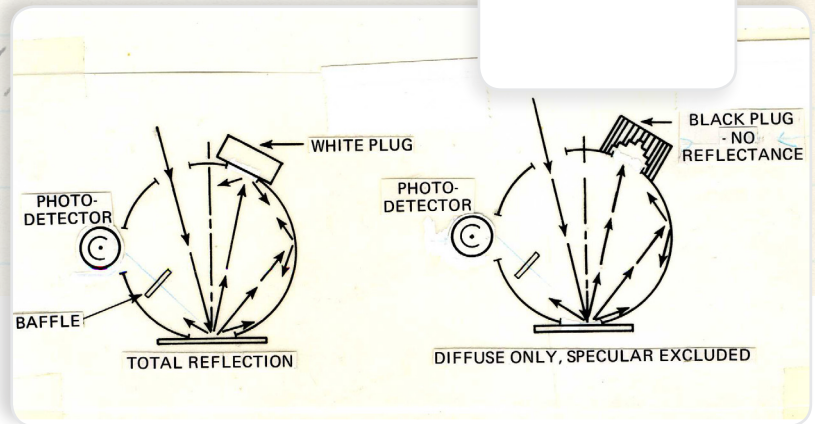
Change of phase of
 $\Delta = 2t + \frac{\lambda}{2}$ (must equal a whole number of λ for a bright fringe or

$$n\lambda = 2t + \frac{\lambda}{2}$$
$$t = \frac{n\lambda - \frac{\lambda}{2}}{2} = \frac{\lambda}{2} \left(n - \frac{1}{2} \right)$$

substituting

$$D^2 = 2\rho \left[\frac{\lambda}{2} \left(n - \frac{1}{2} \right) \right]$$

MM 5033.00



Measuring Opaque Liquids

with UltraScan® VIS

Batch-to-batch color consistency is an important indicator of quality for many opaque liquids. These liquids require special accessories and presentation techniques in order to provide repeatable results.

A HunterLab UltraScan® VIS diffuse/8° spectrophotometer standardized in reflectance, specular included (RSIN) mode can be used to measure the reflectance of opaque liquids that are contained in optically-clear sample cells held in place over the reflectance port. This method is recommended by HunterLab for the measurement of opaque liquids.

THE APPLICATION

Opaque liquids have several non-uniform characteristics that require compensating preparation and presentation techniques in order to ensure a repeatable sample measurement.

Liquids must be contained in and measured through a clear sample cell in order to be effectively made solid.

Liquids may contain bubbles or nonhomogeneous areas that alter the color measurement, requiring the averaging of several readings with replacement.

Recommended Color Scale

CIE L*a*b* or Hunter L, a, b as a full color descriptor

Recommended Illuminant/Observer

D65/10°. C/2° may also be used.



UltraScan® VIS



MEASUREMENT METHOD

1. Configure your software to read using the desired color scale, illuminant, and observer.
2. Standardize the instrument for RSIN and the large area of view, first using the light trap...
3. ...then the white standard tile that came with the instrument.
4. Lower or remove the sample clamp. Install the shelf of the reflectance sample shelf with light cover (HunterLab Part Number B02-1005-172) at the reflectance port.
5. Stir or shake the sample, if necessary, to homogenize it to its usual level. Pour the liquid into the 50-mm glass cell (HunterLab Part Number 13-8573-20) and fill it to the top. Wipe any excess liquid from the outside of the cell with a lintless wipe.
6. Place the filled cell flush against the reflectance port so that the liquid will be read through the clear glass window of the cell.
7. Cover the sample cell with the opaque cover. The cover minimizes the possibility of ambient light reaching the detector through the liquid sample when the measurement is taken.
8. Take a single color reading of the sample. Empty and refill the sample cell and read the sample at least once more. Average the multiple color readings for a single color measurement representing its color. Averaging multiple readings with replacement between readings minimizes measurement variation associated with non-uniformity.
9. Record the average color values for the sample batch.



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.

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**More Information about
Measurement Methods at**

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