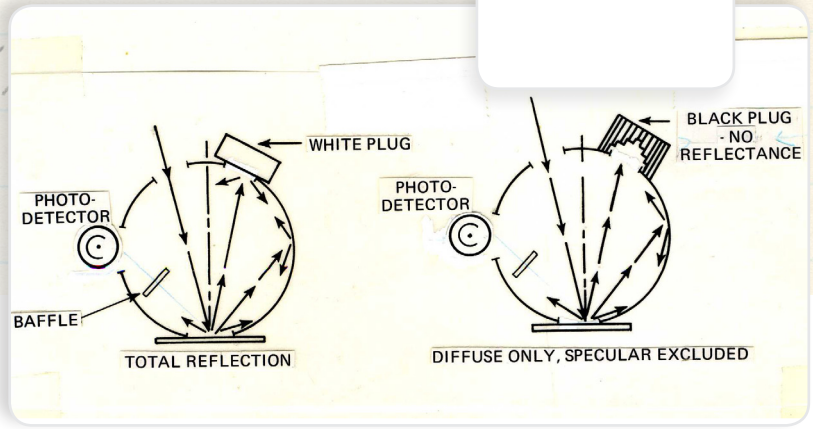
Measurement Method

MM 5045.00



Measuring Translucent Semi-Solids

with UltraScan® VIS

Lot-to-lot color consistency is an important indicator of quality for many translucent semi-solids, such as gels, pastes, and slurries. Translucent samples require special handling when being evaluated either visually or instrumentally. The color of a translucent sample changes when the path length is changed, so that path length must be fixed. Since some of the incident light will travel through the sample, its background must also be constant. Ambient light may also affect the sample's appearance and should be minimized.

The world's true measure of color
HunterLab

By convention, the instrument geometry most commonly used to measure the color of semi-solids is a directional (45°/0° or 0°/45°) geometry instrument such as the LabScan® XE (preferred) or ColorFlex® 45/0. However, it is also possible to measure semi-solid color using a diffuse geometry instrument such as the HunterLab ColorQuest® XE, UltraScan® PRO, or UltraScan® VIS spectrophotometer with appropriate sample devices.

UltraScan® VIS

THE APPLICATION

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

Semi-solids must be measured through the side of a clear glass cell in order to be effectively made solid.

They are translucent — not opaque — and will be sensitive to ambient light, path length changes, background changes, and small differences in the optical configuration of the instrument. Using a constant sample thickness (50-mm recommended) and an opaque cover will minimize these effects.

Note: If inter-instrument agreement is a concern when measuring translucent samples, all the instruments used for those measurements MUST be the same model to minimize measurement differences.

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

Recommended Illuminant/Observer
D65/10°or C/2°.

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. If you wish to minimize the effect of the specular reflectance (shine) of the sample cell window on the sample measurement, standardize in RSEX mode. Otherwise, standardize in RSIN mode.

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. Then fill the 50 mm glass cell (HunterLab Part Number 13-8573-20) to the top with the sample. The 2-inch (50 mm) sample thickness makes the translucent, semi-solid effectively opaque for reflectance measurement.

6. Place the filled cell flush against the reflectance port so that the semi-solid 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 semi-solid sample when the measurement is taken.

8. Take a single color reading of the semi-solid. If the sample is uniform in color (such as plain yogurt) or the tolerances are wide, one reading may be sufficient to characterize the sample color.

For non-uniform samples or to ensure a higher level of measurement repeatability, average several readings (three for samples such as fruit chunk blends) with sample replacement for a single color measurement representing the color of the batch. Scoop or pour the sample out of the cell, refill it, and measure again several times from the same batch. Average the readings together for a single color measurement representing the color of the batch. Averaging multiple readings minimizes measurement variation associated with non-uniform samples.

9. Record the average color values for the sample batch.

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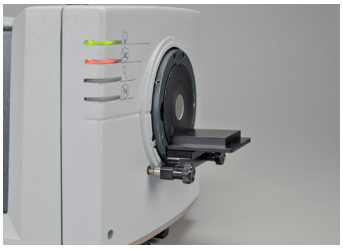

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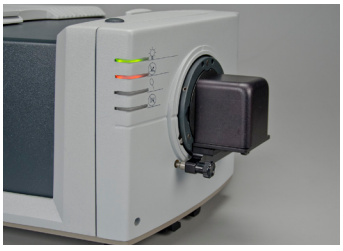

ABOUT HUNTERLAB

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.

More Information about Measurement Methods at

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