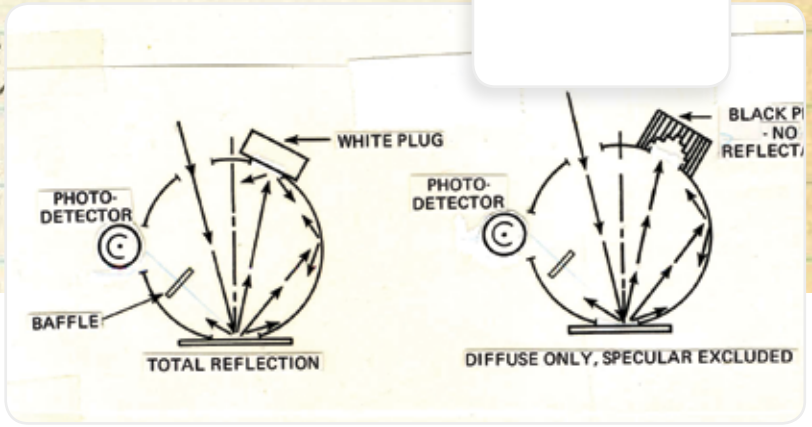
Measurement Method

MM 5032.00



Measuring Lenses

with UltraScan® VIS

Lot-to-lot or piece-to-piece color consistency (or colorlessness, for some) is an important indicator of quality for many transparent items. Clear and tinted ophthalmic lenses and blanks and formed polarizers that are transparent should be measured in total transmittance mode on a benchtop sphere instrument in order to assess the color of the finished item when light shines through it.

The world's true measure of color

HunterLab

A HunterLab UltraScan® VIS Diffuse/8° spectrophotometer standardized in total transmittance (TTRAN) mode can be used to measure the transmittance of transparent lenses that are held in place over the transmission port. This method is recommended by HunterLab for the measurement of lenses, blanks, and formed polarizers.

UltraScan® VIS

THE APPLICATION

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

Lenses are curved and that curvature must be flattened by reading a small diameter at the center of the lens.

Lenses may contain bubbles, scratches, or hazy areas that alter the color measurement and can be asymmetrical in shape, power, and thickness, requiring the averaging of several readings with rotation.

Recommended Color Scale
CIE L*a*b* or CIE L*C*h as a full color descriptor

Recommended Single-Number Indices
dE CMC for total color difference, Y Transmission for lens efficiency, Haze % for clarity, YI E313 when samples are near colorless. Spectral data at 370 or 380 nm may also be of interest when UV absorbers are present (possible with UltraScan® PRO and UltraScan® VIS only).

Recommended Illuminant/Observer
D65/10°. C/2° may also be used.

MEASUREMENT METHOD

1. Configure your software to read using the desired color scale, illuminant, and observer.

2. Install the 3-point lens holder (HunterLab Part Number CMR-2615) or 80-mm lens holder (HunterLab Part Number CMR-2946) at the transmission port (sphere) as described in the addendum for the CMR. Note that CMR 2946 is designed specifically for lenses with a fixed 80 mm diameter. CMR 2615 will accommodate lenses between 25 mm and 80 mm in diameter.

3. Standardize the instrument in TTRAN mode, first by sliding the black card device between the lens holder and the transmission port. The large area view (LAV) port plate and lens position should be used for these measurements.

4. Complete the standardization by removing the black card from the transmission compartment and placing the white calibrated tile at the reflectance port. Please note that the CMR 2615 holder must be removed from the transmission compartment prior to this step.

5. Install the lens into the lens holder with the concave side facing the sphere as described in the addendum for the CMR. Close the transmission compartment door.

6. Take a single color reading of the sample. Rotate the sample and read it at least twice more. Average the multiple color readings for a single color measurement representing the lens's color. Alternately, measure multiple lenses from a lot one time each and average the readings. Averaging multiple readings with rotation between readings minimizes measurement variation associated with non-uniformity.

7. Record the average color values for the lens or lot.

2.

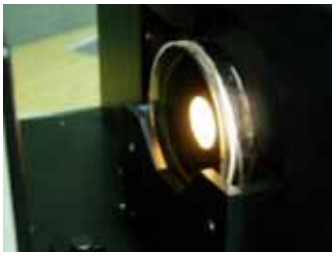
CMR 2946

4.

5.

CMR 2615

5.



CMR 2946

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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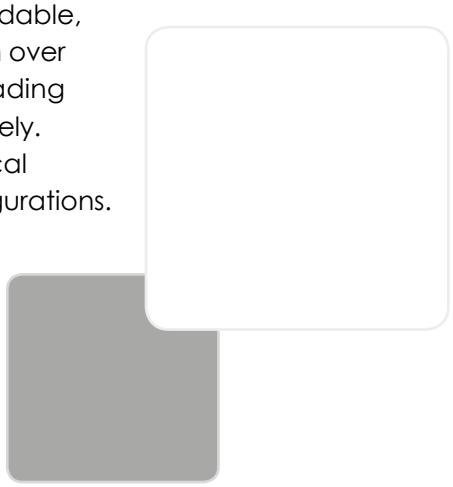

More Information about Measurement Methods at
hunterlab.com

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