

## Measurement Method

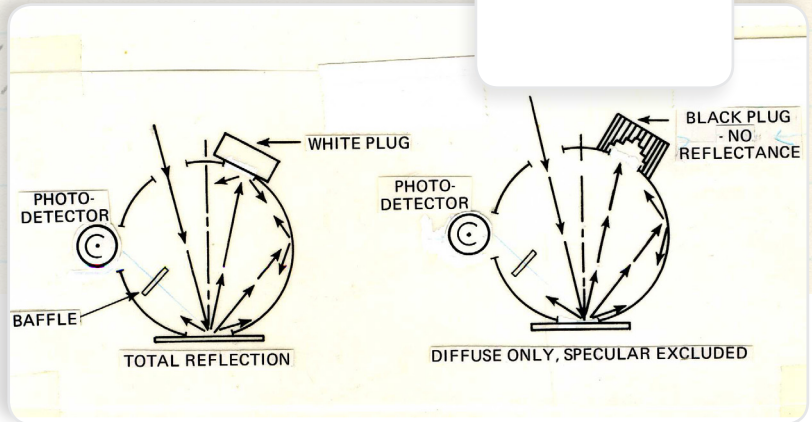
Change of phase of  
 $\Delta = 2t + \frac{\lambda}{2}$  (must equal a whole number of  $\lambda$  for a bright fringe or

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

substituting

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

MM 5053.00



## Measuring Carpet with UltraScan® PRO

Lot-to-lot or piece-to-piece color consistency is an important indicator of quality for many colored items. Carpet can be easily measured at the reflectance port of a benchtop sphere instrument such as the UltraScan® PRO.

A HunterLab UltraScan® PRO Diffuse/8° spectrophotometer can be used to measure the reflectance of carpet samples that are placed over the reflectance port. This method is recommended by HunterLab for the measurement of carpet.

### THE APPLICATION

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

Carpet may not be completely opaque and may look different when backed with differently colored samples. Using a constant sample backing will minimize these effects.

The samples may be directional and/or non-homogenous, requiring the averaging of several readings with rotation.

Carpet samples are flexible, and care must be taken that they do not pillow into the measurement port.

The samples (particularly white ones) may be fluorescent, which means that they will be sensitive to the UV content of the light source.

Recommended Color Scale

**CIE L\*a\*b\* as a full color descriptor**

Recommended Illuminant/Observer

**D65/10°.**



UltraScan® PRO



## MEASUREMENT METHOD

1. Configure your software to read using the desired color scale, illuminant, and observer.
2. Standardize the instrument in Reflectance - Specular Excluded mode for the large area of view using the port insert with glass (HunterLab Part Number A02-1011-124 for ColorQuest® XE, UltraScan® PRO, and UltraScan® VIS). First standardize on the light trap, then the white tile.
3. Cut a piece of carpet from the roll that is large enough to completely cover the opening in the port insert.
4. Center the sample to be measured over the reflectance port and hold it in place and back it using the sample clamp or (preferred) the compression clamp (HunterLab Part Number D02-1011-132 for ColorQuest® XE and UltraScan® VIS, D02-1008-987 for UltraScan® PRO). Make sure that the area of the sample to be measured faces the port and completely covers the port.
5. Take a single color reading of the sample. Rotate the sample 90°, move it so a different area (where the pile has not already been crushed) covers the sample port, and read it at least once more. Average the multiple color readings for a single color measurement representing its color. Averaging multiple readings with rotation between readings minimizes measurement variation associated with directionality and non-homogeneity.
6. Record the average color values.



## 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](http://hunterlab.com)*

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