

## Measurement Method

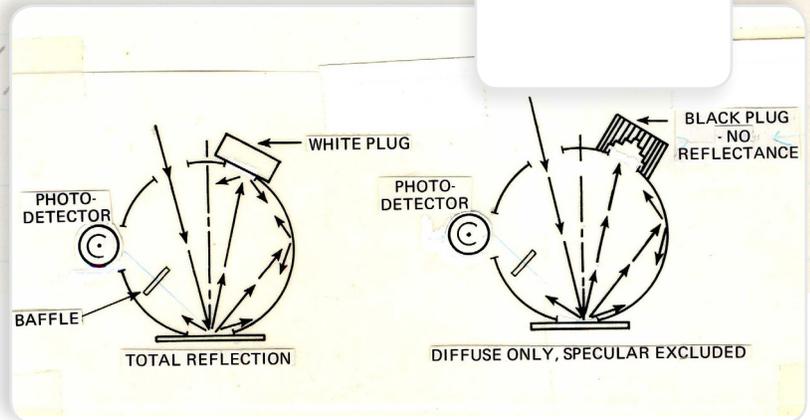
Change of phase of  
 $\Delta = 2t + \frac{\lambda}{2}$  (must equal a whole number of  $\lambda$  for a bright fringe or

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

substituting

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

MM 5047.00



## Measuring Metal Surfaces

with UltraScan® VIS

Lot-to-lot or piece-to-piece color consistency is an important indicator of quality for many colored items. Bare, uncoated metal items or those plastic or glass products that simulate a metal surface, can be easily measured at the reflectance port of a benchtop sphere instrument such as the UltraScan® VIS.

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

### THE APPLICATION

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

The samples may be directional, requiring the averaging of several readings with rotation

The surface of the sample is generally shiny and/or polished, requiring use of the reflectance, specular included (RSIN) mode for viewing the color of the surface, which is seen primarily in the specular reflection.

Recommended Color Scale

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

Recommended Illuminant/Observer

**D65/10°**.



UltraScan® VIS



## MEASUREMENT METHOD

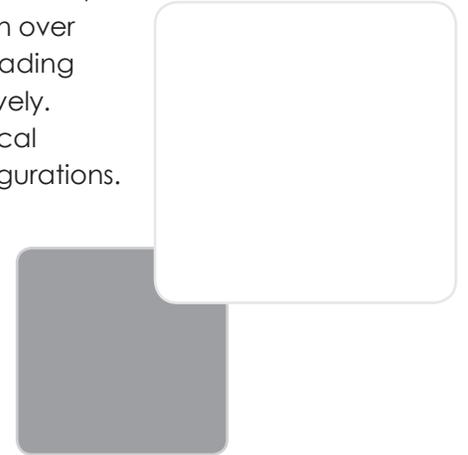
1. Configure your software to read using the desired color scale, illuminant, and observer.
2. Standardize the instrument in Reflectance - Specular Included mode for the largest area of view possible for which the sample can completely cover the hole in the port plate (preferably LAV). First standardize on the light trap, then the white tile.
3. Center the sample to be measured over the reflectance port and hold it in place using the sample clamp. Make sure that the area of the sample to be measured faces the port and completely covers the port.
4. Take a single color reading of the sample. Rotate the sample 90° 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.
5. 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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