

## Measurement Method

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

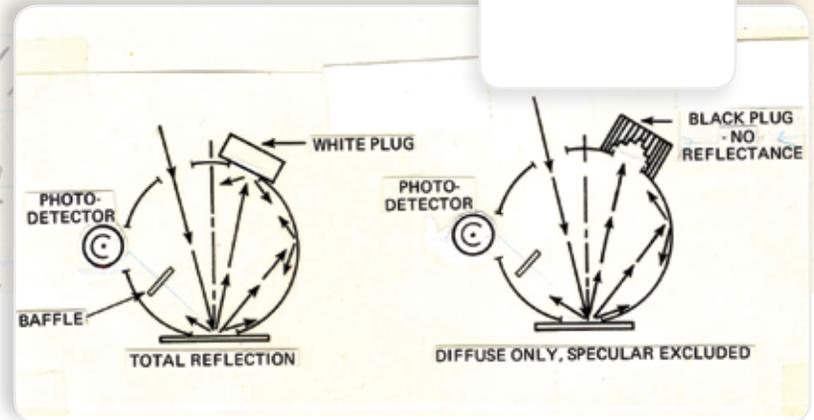
$$n\lambda = 2t + \frac{\lambda}{2}$$

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

substituting

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

MM 5126.00



## Measuring Snack Food Using the Compression Ring and Pan Set with D25<sup>®</sup> NC

The color of large, granular food pieces, such as chips or similar snack foods, must be assessed both to ensure lot-to-lot consistency and, in some cases, as an indicator of completeness of baking or frying. These types of samples are typically large, non-uniform in size and shape, and may be semi-transparent. Therefore, special accessories and presentation techniques may be used to provide uniform sample presentation and more repeatable results.

The Sample Handling Package for Chips (L02-1014-741) can be used to make the samples more uniform in height and opacity. The D25 NC averages 5 measurements per second, 25 measurements per each rotational cycle of the turntable.

A HunterLab D25® NC can be used to measure the reflectance of batches of samples as they move under the sensor without touching the sample surface. This is an alternative method to loose pour method use for the measurement of chips and snack foods.

### THE APPLICATION

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

The available measurement area of individual pieces may be very small and/or curved, and vary in translucency. The surface of samples can be made more uniform and opaque by using the HunterLab Sample Handling Package for Chips. This set consists of 3 parts; a sample dish (D04-1013-402), and the Compression Ring and Pan (A13-1013-901)

Weighing and compressing the chips ensures a more uniform sample presentation

These pieces are irregular in color and shape, and require 2 or more cycles of turntable rotation.

Recommended Color Scale

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

Recommended Illuminant/Observer

**C/2° D65/10°.**



D25® NC



## MEASUREMENT METHOD

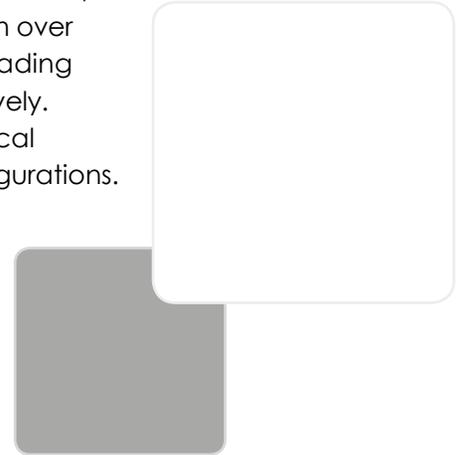
1. Configure the touch screen software to read using the desired color scale, illuminant, and observer. Set the measurement time for 10 seconds (2 cycles).
2. Standardize the instrument using the black and calibrated white standards that come with the instrument. Confirm that the instrument is working properly by using the green check tile at the end of the standardization procedure.
3. Place the compression ring on top of the sample dish (D04-1013-402). Measure 150 g of sample and pour into the sample dish. Ensure that there are sufficient chips at the edges of the pan then press down firmly until the top of the collar is reached. Remove the compression ring and pan and inspect the sample surface for flatness and fill.
4. Place the sample on the sensor turntable.
5. Ensure that the sensor is correctly positioned 2.5 inches (65 mm) from the center of the turntable using the horizontal adjustment arm. Use the vertical adjustment arm to position the sensor 85-95 mm above the sample surface. The built-in Height Sensor is located in the Diagnostic menu.
6. Press the "Measure" button on the sensor to start the rotation of the turntable and sensor measurement cycle.
7. 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***

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

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