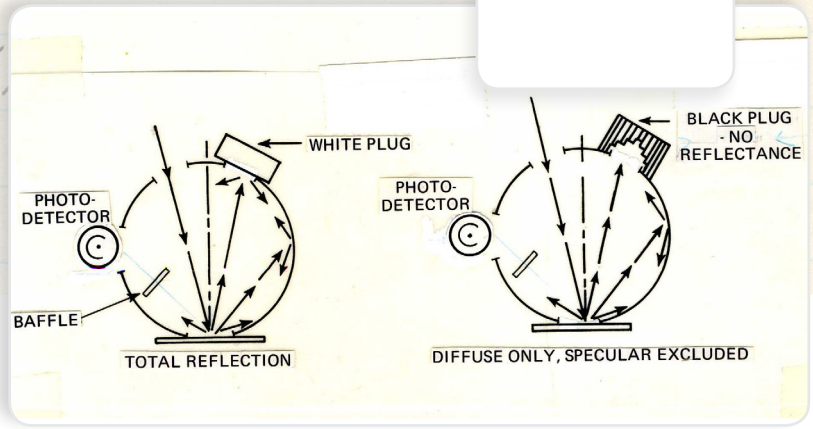
Measurement Method

MM 5041.00



Measuring Transparent Bottle Preforms

with UltraScan® VIS

In the plastics industry, the color of plastic preforms is often measured before the preforms are blown into bottles as a predictor of the color of the final blown product. Preforms that are transparent may be measured in total transmittance (TTRAN) mode using a benchtop sphere instrument such as the UltraScan® VIS.

The world's true measure of color
HunterLab

A HunterLab UltraScan® VIS Diffuse/8° spectrophotometer can be used to measure the transmittance of transparent preforms. A special transmission sample holder is required to hold the preforms at the transmission port. This is the method advocated by HunterLab for the measurement of transparent bottle preforms of various sizes.

UltraScan® VIS

THE APPLICATION

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

The samples are rounded, and so consistent placement using a special handling device is required in order to make the samples appear as flat as possible to the instrument.

The samples are transparent and will look different when backed with different backgrounds. Using a special handling device that provides a constant background will minimize this effect.

The preforms may contain bubbles or hazy areas that alter the color measurement, and there may be variation in the color uniformity and wall thickness, requiring the averaging of several readings with rotation.

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

Recommended Single-Number Indices
YI D1925 (2/C), YI E313 when samples are near colorless, Haze

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 transmission preform holder (HunterLab Part Number D02-1011-833; pictured at right) in the transmission compartment as described in the user's manual.

3. Standardize the instrument in TTRAN mode on air, using Small as the area view and 0.375-inch as the port size. When prompted for the black card, slide it between the preform holder and the transmission port.

4. Open the holder. It is easiest to do this by placing an index finger between one of the metal pegs on top of the holder and the transmission port and resting the thumb of the same hand on the end of the corresponding spring screw. Pull the index finger toward the thumb until the holder provides an opening large enough for insertion of the desired preform.

5. Insert the preform into the holder as far as the preform will go with the threads up. Then close the holder and confirm that the preform is held securely in place.

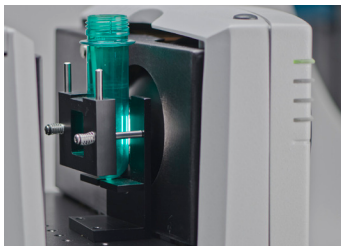
6. If possible, close the transmission compartment door, and then make your measurement.

7. Open the transmission compartment door, rotate the preform, and measure it again. 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.

8. Record the average color values.

2.

5.



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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