

Applications Note

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

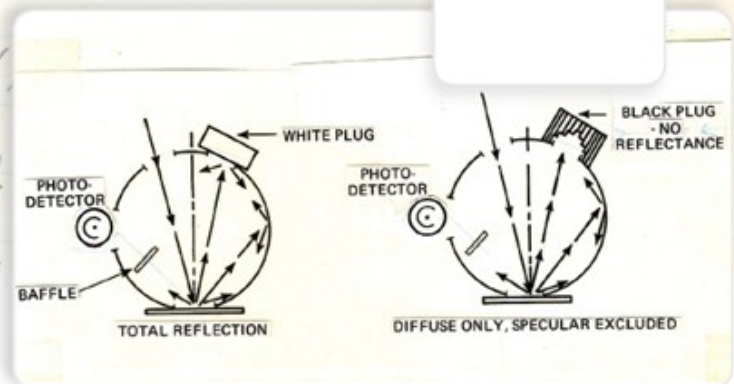
$$n\lambda = 2t + \frac{\lambda}{2}$$

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

substituting

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

AN 1003



Color Measurement On Very Small Samples

“...The consistent measurement of ultra small samples provides a measurement challenge in addition to a business challenge.”

Abstract

When product is in short supply or is very expensive, it is important to use the smallest amount of sample possible for color measurement.

This application note describes HunterLab's color measurement solutions for consistently reading very small amounts of solids, powders, and liquids.

Challenge: To measure small to micro samples with precision.

In some applications, samples may be rare, very valuable or in short supply, typically in quantities from small-to-micro. The consistent color measurement of small samples is possible with special accessories. Development of a repeatable measurement method is essential for color discrimination in these small samples.

Consideration should be given to an appropriate instrument, color scale, illuminant, observer and special sample holder, if necessary.

Measurement Solutions for Solids in Reflectance Mode

In the case of a solid sample, the port opening must be reduced to allow for viewing of the sample without a background. Many HunterLab instruments have the ability to switch from the normal LAV - Large Area of View to an SAV - Small Area of View with a motor. When placing the sample for measurement, the retroviewer option is used to ensure that the desired sample area completely covers the opening in the port plate. This means that the sample size must be equal to or slightly larger than the 4 mm or 3 mm openings. In addition to lining up the sample correctly, the change of geometry with this option will cause a slight shift in the color values of the calibration standards.

Measurement Solutions for Transparent Liquids in Transmittance Mode

For liquids, HunterLab offers a semi-micro cell holder with beam-reducing optics fitted into the holder. This is installed in the transmittance compartment and then the instrument is standardized. The user chooses a 10 mm or 20 mm pathlength transmittance cell. A semi- micro cell filled with the sample is then inserted for measurement.

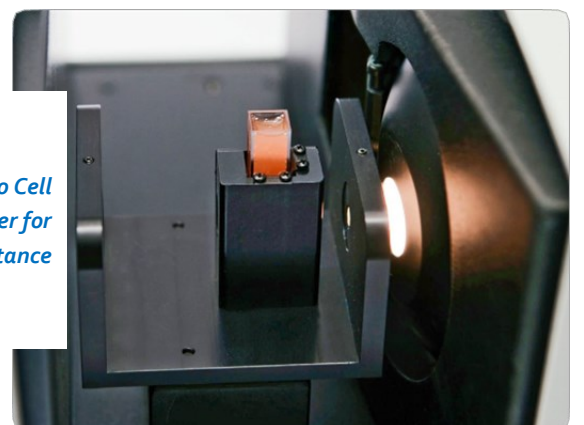
Note: *The same cell used to hold the blank during standardization should be used for sample measurements, particularly when disposable cells are used.*



Small Area of View (SAV) are required. Performance specifications will not be met with this port plate.



The powder holder should be used ONLY for color difference measurement.



*Semi-Micro Cell
Holder for
Transmittance*

Conclusion

HunterLab has developed several helpful accessories to assist customers with some unique sample presentation involving small-to-micro quantities of sample. For more information and to solve another unique problem, please contact Technical Services at www.hunterlab.com/service.

References

1. Hunter, Richard S., and Harold, Richard W., The Measurement of Appearance, 2nd Ed., John Wiley and Sons, Inc. New York, NY USA 1987

About HunterLab

HunterLab is the technology leader in color measurement solutions, providing instruments, software, knowledge and service to a wide variety of industries. With over 5 decades of experience in more than 65 countries, HunterLab applies our leading edge technology to your products helping you measure and communicate color simply and effectively.

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