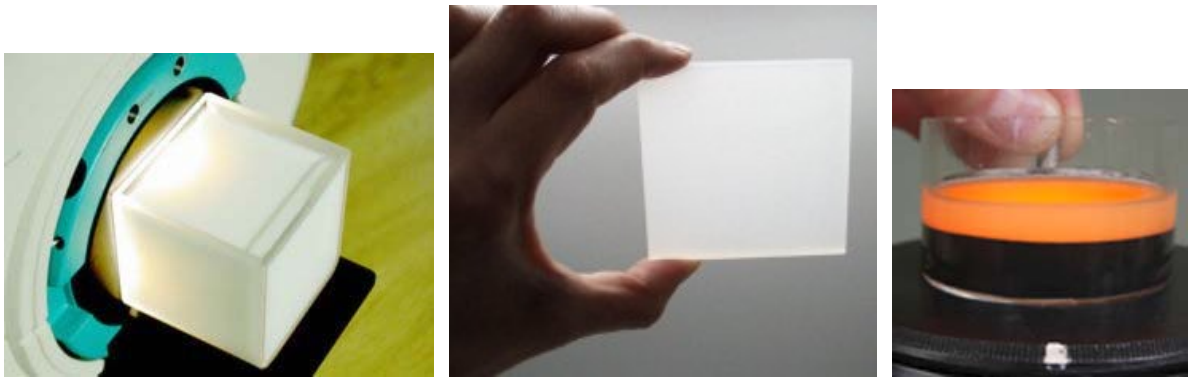
Applications Note

Insight on Color Vol. 3, No. 3

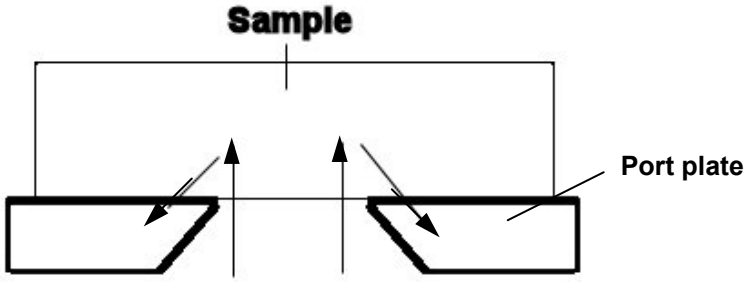
Translucency, Port Size, and Area of View

All diffusely reflecting objects scatter light internally, but in translucent objects the scattering points are far apart, allowing incident (source) light to travel a noticeable distance before it re-emerges. This can make a translucent object appear to glow when illuminated at one spot. Orange juice, milk, and many plastics are examples of such translucent materials.

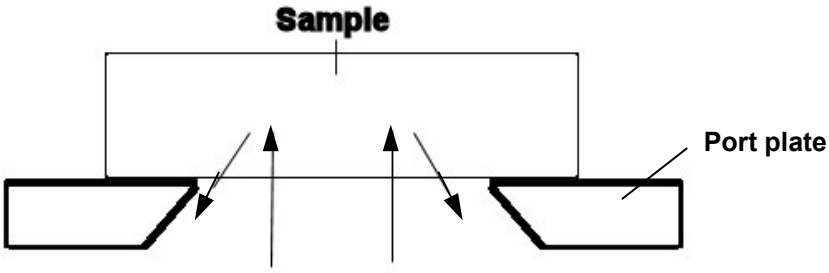


Examples of translucent samples. Notice the "glow."

Normally, a translucent object is seen entirely illuminated, and the viewer tends to concentrate on a portion of the surface away from the edges in order to form a judgment of color. Therefore, if you wish to have an instrument assess color and to have it correlate well with visual observation, the open port area offered to the instrument should extend well beyond the area viewed, as shown below.



An instrument with a small port opening traps internally scattered light.



An instrument with a larger port opening allows internally scattered light to be viewed by the sensor.

To illustrate, a translucent plastic plaque similar to the one shown at the very top of this *Note* was measured using two different instrument configurations. First, a LabScan XE was standardized with the 2-inch port plate installed and the matching 1.75-inch area view indicated to the software. Then, the LabScan XE was standardized with the 2-inch port plate installed and the smaller 1.00-inch area view indicated to the software. The sample was measured in each configuration, backed at the sample port with a white tile. Results are shown below.

D65/10°	LabScan XE with 2.00-inch port and 1.75-inch area view	LabScan XE with 2.00-inch port and 1.00-inch area view
L*	87.13	84.93
a*	-1.29	-1.62
b*	-3.22	-4.50
Whiteness Index E313	85.93	88.27

Using a smaller area of view than port size allows the externally scattered light to leave the sample and become part of the measurement. We can see this particularly in the a* and b* values, where the smaller area of view yields larger values (more chroma) since less light is lost, and the Whiteness Index, which is also greater for the smaller area of view, helping to emphasize any differences in color between samples and correlating better with visual analysis.

For Additional Information Contact:

Technical Services Department
Hunter Associates Laboratory, Inc.
11491 Sunset Hills Road
Reston, Virginia 20190
Telephone: 703-471-6870
FAX: 703-471-4237
www.hunterlab.com