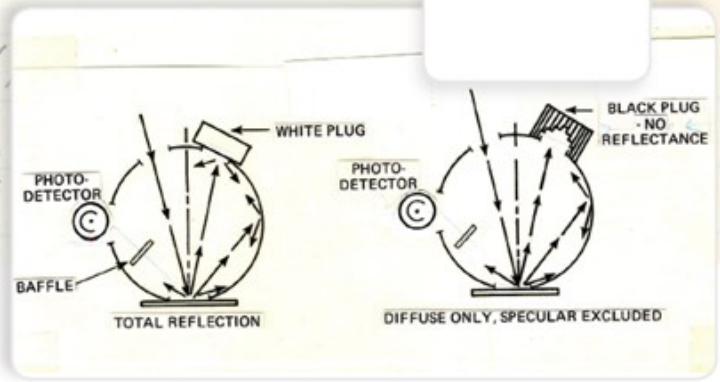
Applications Note

AN 1067



Measuring the Color of Samples that Pillow

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Abstract

Flexible samples like textiles, carpet, and paper may dip, or "pillow," into the open sample port of a spectrophotometer. Unfortunately, this means that some parts of the sample will be closer to the instrument optics than others, which can yield to inconsistent color readings. For this reason, these types of samples are usually pulled taut and flat around a white backing, such as a spare white tile or the white disc of a sample clamp, so that the sample cannot pillow into the port.

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To demonstrate this reasoning, the blue carpet sample shown below was measured several times on a ColorQuest 45/0 LAV. The first time, the carpet was backed with a white tile that was pressed hard towards the sample port, forcing some of the carpet fibers into the port. The second time, a moderate amount of pressure was used to press the carpet into the port. The third time, the carpet was backed by the white tile without any extra pressure applied.

The following color values were received (D65/10°).

Pressure	L*	a*	b*
High	23.47	-1.18	-15.34
Moderate	23.55	-1.31	-15.15
None	23.36	-1.31	-15.14

Just as expected, there are differences in the readings with different levels of pillowing. While the differences are small for this particular sample, they may be significant, particularly when tolerances are tight. Plus, the color differences could be even greater for samples that are more flexible than relatively firm carpet.

So, what does this all mean? It means that for each type of flexible sample you measure, you need to choose a method for eliminating pillowing, and stick with it. If you measure some samples allowing pillowing and others without allowing pillowing, you will not be able to compare the measurements. So, what is the best method for preventing pillowing for your samples? That depends.

If your instrument has a sample clamp, it is usually easiest to ensure that the clamp's white disk is installed and then use the sample clamp to hold the sample in place at the port. To prevent pillowing, use both hands to stretch the sample a bit around the perimeter of the clamp, ensuring that there are no wrinkles or folds under the clamp. If you don't have a sample clamp, you can use a spare white tile or a piece of firm white cardboard. Wrap the sample around the white face of the tile or card and hold it at the back of the tile or card. Look at the area of the sample to be measured and make sure it is flat,

not wrinkled or folded. Present this flat surface to the instrument. You may also use a port insert covered with glass to prevent the sample from entering the port.

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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