

For decades, spectrophotometric color measurement has played an integral part in the development and production of paper products that meet the diverse needs of consumers in a competitive and growing marketplace. The high level of accuracy, [precise quantification of spectral data](#), [non-destructive nature](#), and [versatility of spectrophotometers](#) have made them central to color quality management for paper manufacturers around the globe. However, the increasing popularity of optical brightening agents is posing considerable challenges for spectrophotometers unequipped to handle these unique color enhancers. As the use of these chemical compounds continues to expand, choosing an instrument that allows you to precisely analyze treated papers is more critical than ever before to satisfy the demand for the bright, aesthetically pleasing papers consumers have come to expect.

The Effects of Optical Brightening Agents

Traditionally, white paper was created by bleaching processes that removed residual color by chemically modifying the raw materials themselves. However, bleaching alone cannot adequately or economically create the bright whites desired in today's paper products. As such, manufacturers of all types of paper products – from high-end fine art papers to household tissue – have turned to optical brightening agents (OBAs) that use fluorescence to compensate for yellow paper hues, allowing even lower quality raw materials to produce clean, beautiful papers. [1](#) OBAs work by absorbing non-visible UV light below 400nm and emitting visible light in the 400-480nm range to give paper a slightly bluish appearance that we perceive as bright white. While OBAs are extraordinarily useful for paper manufacturers, they also present special challenges for both visual color assessment and spectrophotometric color measurement. UV-dependent chemistry can cause dramatic differences in appearance based on light conditions and make papers [highly vulnerable to metamerism](#); [visual evaluation of OBA-treated papers is then extraordinarily unreliable and spectrophotometric assessment requires careful, controlled illumination for accurate and consistent measurement across the supply chain](#). As *Quality Mag* notes:

Defining and controlling the emitted UV component of the measuring device's illumination is essential to defining standard ways to measure and manage color printed on OBA-enhanced materials. This requires the use of spectrophotometers that use calibrated UV light to measure OBAs with a level of confidence in the color data acquired when measuring OBA-enhanced materials—regardless of where or when the measurements are collected. [2](#)

Additionally, the unique spectral phenomenon of fluorescence can also cause spectral reflectance in the 400-480nm range to exceed 100% when fluorescence and ordinary reflectance of radiation combine, leading to potential instrumental confusion. As such, spectrophotometers with features that allow you to account for UV-excitability and modulate light conditions are critical to precise analysis of OBA-treated materials.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-measurement-2/addressing-the-challenges-of-optical-brightening-agents-in-paper-color-measurement/>