



Millions of pens write in exactly the same shade of blue, a feat of very careful quality control. Image Credit: Flickr user Emil. (CC BY 2.0)

Hidden in the byzantine halls of the U.S. Secret Service lies a nondescript library. In this seldom-visited area are contained the exact profiles of more than 11,400 writing inks. Using the latest high-tech devices, agents can pinpoint the origins of any writing ink. Each contains, within its complex chemical makeup, clues as to origin—clues that can be traced back to the manufacturer, year produced, and even batch.

Only select investigators might wholly understand this analysis process. But the fact that inks are so sensitive, so infinitely varied, should come as no surprise to anyone who manufactures them.

Who's Got the Ballpoint Pen Blues?

Different manufacturers produce different materials; different materials make different inks. As Lisa Hahn, President of Flexo Tech, puts it, "Blue is not blue is not blue. I may have a blue that's somewhat chlorinated so that it has a green shade. But a blue from Company A may not have the same shade of green tint as the one from Company B. While they may have the same degree of blueness the undertone will not be the same."¹

Thus, when managing the production of inks for ballpoint pens, it's essential to implement an effective color quality control system to identify even slight variations from the standards that have been prescribed by clients or a parent company.

Complexities of Ink Production Cause Fluctuating Results

Differences between suppliers is only one of many factors² affecting the eventual color of finished pen ink. Dispersants must be correctly chosen, grinding must be accomplished using the right technique, proper proportions must be measured and delivered, contaminated residue in mixing areas and delivery systems must be removed, and the desired viscosity must be achieved. Formulas will vary based on whether pigments are added to propylene glycol, propyl alcohol, toluene, or glyco-ethers resins. Further, these factors must all be considered in their relationship to one another, as variation in any one will require countering variations in the rest to maintain equilibrium. Such complexities insist that batches *will* emerge which vary from each other.

But inconsistent ink color can damage a producer's bottom line. Should batches fail to match industry specifications, client tolerances, or internal standards, they must be retreated, costing time and materials.

Walt Zawacki, senior scientist at Flint Ink Corporation, specifies that the color of ink must be assessed for a number of reasons:

"Some of the most common reasons are conformance, communication and consistency. We may want to check an ink's conformance to a standard (such as ISO 2846-1) or industry specification (such as SWOP). We may then want to communicate those results to others within our organization or to the customer. We want to do this accurately and consistently. If the measurements are made and reported in accordance with ANSI CGATS.5 (same as ISO 13655), then we should be successful."³



How many different pens were used to color all these different colored pens? Image Credit: Flickr user andrea joseph ([CC BY 2.0](#))

Spectrophotometers Ensure Ink Color Matches Specifications

To keep pace with the continuous production⁴ of ink and make adjustments mid-process, an on-line spectrophotometer such as [HunterLab's SpectraTrend HT](#) can be employed. Spectrophotometers assess the spectral profiles of material objects, determining exact colors by examining the relative strengths of light at wavelengths within nanometer precision. An integrated system such as the SpectraTrend HT can perform this operation without interruption.

The system can compile averages across batches, and compare the information to historic color and process information.⁵ This allows technicians to make appropriate adjustments without halting production or remixing materials—and predicts for them exactly which adjustments are needed based on archived data.

Maintaining consistent color quality is vital for ink producers. To stay competitive in the global market, especially now that China has finally mastered⁶ the ball point pen tip, manufacturers of pen ink must stay efficient by avoiding waste and rework. An on-line spectrophotometric system can keep plants pumping out ink around the clock by informing employees of the right adjustments at the right time.

For more information on the best system for your organization, [contact the experts at HunterLab today](#). We have over sixty years of experience providing high-quality spectrophotometers for leaders [in a wide variety of industries](#), and we're proud to offer unparalleled customer support.

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