

Visual analysis is an important part of the inspection process in the pharmaceutical industry. Strict regulations and processes dictate the safety and effectiveness of all prescription drug medications. While human visual analysis plays an essential role in parenteral drug production¹, human error accounts for a considerable amount of oversight throughout the industry.² Instrumental visual analysis technology has revolutionized prescription drug manufacturing and is quickly becoming the ideal method of analysis for most pharmaceutical products.

Applications of Spectrophotometry in the Pharma Industry

Spectrophotometry has been used for decades as an inspection tool in pharmaceuticals. As technology advances, instrumentation continues to provide an essential method of detection that exceeds human visual analysis. Slight color changes can be detected through simple, yet highly sensitive methods of spectrophotometry that measure [variations in absorption values](#) which can indicate any deviations in formulations. Each pharmaceutical compound can be represented by a [colorimetric assay](#) that acts as a blueprint for nearly any pharmaceutical compound and extends beyond visual analysis capabilities. This data can be stored and shared beyond the laboratory environment to ensure that compounds maintain their [active pharmaceutical ingredient \(API\) strength](#) and remain free of any contamination or defects.

This same technology also helps drug manufactures maintain consistency of batch concentrations to guarantee that drug formulations respond as expected. This not only helps to maintain safety and effectiveness, but also effectively monitor quality control. As more variations of prescription drugs flood the market, advanced technology will increasingly be required to provide accurate visual analysis to meet demand in a timely manner.

Human Eye Technology Reduces Errors

Fatigue and mental exhaustion often contribute to human errors. While visual analysis and inspection are still valued in the industry, the United States Pharmacopeial Convention (USP) Visual Inspection Expert Panel³ continues to explore other options in technology to develop best practices for meeting industry standards and regulations. With a variety of instrumental options available, human visual analysis can easily be replaced by more effective hand-held, benchtop, or in-line tools that quickly and effectively provide the data needed to maintain drug safety and reliability.

From parenteral pharmaceuticals to prescription pills, capsules, and other forms of medications, spectrophotometry continues to take center stage in pharma technology that is simple, fast, and effective. More labs and pharmacies rely on advanced color technology to maintain consistency in their formulations, as well as the effectiveness and safety of their products.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-pharmaceuticals/replacing-visual-analysis-how-to-avoid-errors-and-maintain-safety-in-the-pharma-industry/>