

Medical test strips must be as accurate as possible to be effective, as even subtle color inconsistencies between the strip and the color-coded test package could have negative consequences for the person using the strip. For example, if someone who has diabetes uses a urinalysis test strip to monitor the condition, a disagreement between the strip's color and the diagnosis code could lead to an inaccurate assessment of blood glucose levels, potentially compromising patient health.

For this reason, medical test strip manufacturers need to have a reliable color quality control protocol in place when they create their products. Spectrophotometric instruments allow manufacturers to ensure that their test strips and diagnosis codes match as perfectly as possible, making it easy for customers to see where they fall on the color scale.

Why Color Accuracy Matters in Medical Test Strips

While many healthcare professionals use medical test strips to diagnose conditions in patients, self-administered [over-the-counter medical test strips are becoming more popular](#). In fact, [at-home test strip sales increased by more than 45 percent between 2010 and 2012](#).¹ The blood glucose test strip market, in particular, is consistently growing in value and is expected to be worth nearly \$13 billion worldwide by 2021.²

However, despite the popularity of at-home test strips, there are still some risks associated with using test strips at home. In a medical office, doctors have more tools at their disposal to diagnose and monitor health conditions such as diabetes. As such, if a test strip appears muddled in color or inaccurate, a medical professional can simply run other tests to reach a correct diagnosis. At home, however, test strip users rely entirely on the strip's color accuracy to provide them with vital information about their health. Unless they make a follow-up appointment with their doctors to confirm whether the test strip was accurate, at-home test strip users have to take the test strip's color at face value.

The challenge that manufacturers face is that test strip colors aren't always as clear as they should be. For example, one study found that patients frequently struggled to correctly interpret the color of their blood glucose test strips, especially when those patients had a visual impairment or viewed the strips under poor lighting conditions.³ Moreover, [even if test strip users correctly interpreted the color of the test strip, if this color didn't perfectly match the sample colors provided by the test strip manufacturer, users couldn't reach a reliable diagnosis](#).

This is a potentially dangerous problem for test strip users and manufacturers alike. A user might have a high level of glucose in the blood, but if the test strip's color is unclear or it doesn't match the colors provided by the manufacturer, the user might not be sure of a high glucose diagnosis. As a result, the user might not take the necessary steps to bring glucose levels down to a normal level.⁴ [To solve this problem, test strip manufacturers must refine their color quality control protocols to ensure that every test strip provides, clear, accurate results](#).

How to Improve the Accuracy of Your Medical Test Strips

To ensure that your medical test strips are as accurate as possible, you should use a color spectrophotometer to compare a sample test strip's results to your existing color chart. A spectrophotometer is the best tool to use for color quality control because the instrument is capable of detecting even subtle variations between colors and objectively quantifying color information. This is essential when you are designing a new medical test strip product and creating a reliable color chart that your customers can follow when they use your products. You can use a spectrophotometer to set color standards for all of your medical strip products.

For example, if you're creating a new strip that tests for ketosis levels, you must coat [the testing paper in a substance that changes color when it comes into contact with acetoacetate in urine](#).⁵ This coating typically ranges from a pale beige color when little acetoacetate is present to a deep shade of brown or purple when high levels of acetoacetate are present. All ketosis test strips use the same type of coating to get the most accurate results, however, the reliability and accuracy of the test strips depend on how detailed the color chart is.

To ensure that your color chart is reliable, you can expose your sample test strips to different levels of acetoacetate and then test the color of these samples using a spectrophotometer. Once you have your spectrophotometric color results, you can then create a paper color chart that matches these sample colors perfectly. A spectrophotometer allows you to get an exact color match between your test strips and your chart, which in turn improves the quality of your final test strip product.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-pharmaceuticals/color-spectrophotometers-are-essential-for-creating-accurate-medical-test-strips/>