

Raw beeswax is a key ingredient in a wide range of popular products, from lipstick to [candles](#). However, to create products from beeswax, manufacturers have to ensure that the wax is consistent in color and free of impurities. Any variation in color from one batch of beeswax to another could negatively impact the final color of the product.

The primary challenge manufacturers face when working with raw beeswax is that this material is naturally diverse in color; unless the manufacturer consistently sources its beeswax from the same bee farm and controls every aspect of the farm's environment, the color of beeswax can range anywhere from pale yellow to deep orange in color. To achieve color consistency in their products, manufacturers must, therefore, have strict color quality control protocols in place when using raw beeswax as an ingredient. By testing wax using a spectrophotometer, you can significantly improve the consistency of your products and achieve reliable color results.

The Challenges of Testing Beeswax for Color Consistency

The primary reason beeswax is such a challenging ingredient to work with is that a number of environmental factors can impact the color of the wax.¹ All beeswax is white when bees first create it. However, it doesn't remain this color over time; as the bees gather nectar from neighboring flowers, pollen and propolis (resin from the bark of trees) get stuck to their legs and bodies. This material latches onto the white honeycomb, causing the honeycomb to turn yellow. The darker the pollen and propolis are in a region, the darker the resulting beeswax is.

This is why many manufacturers that use beeswax source their wax from the same farm or from the same general region of the world. The bees in the area are gathering nectar from the same types of flora, so the wax they produce appears roughly the same color. For example, Burt's Bees sources all of its wax from four farms in East Africa, and as a result, the wax is mostly consistent from batch to batch.² Additionally, most bee farms in Africa don't use pesticides and have very little air pollution, both of which can alter the natural color of beeswax. This is why many manufacturers choose to work with African beeswax, as it is considered the purest in the industry.

However, even if you source your wax from the same high-quality farm, there's no guarantee that your wax will be completely consistent in color. Factors like weather and available food sources on the farm could cause color variations even in wax produced by the same population of bees. For example, if flowers with dark-colored pollen aren't yet blooming due to poor weather, the bees will produce wax that is much lighter than usual.

This is a problem for your products because it will make them appear inconsistent. In [cosmetics products](#), in particular, customers expect to find the same color and texture every time; if a customer has a favorite red lipstick, any variation in this color will reduce customer satisfaction. Beeswax that's too dark in color could make a red lipstick appear brown and muddy, and this will negatively impact the customer's perception of the product.³ This is why, to ensure color consistency, you must test for variations in color between all of your raw beeswax shipments and filter out impurities in the raw wax until it adheres to color standards.

How to Use Spectrophotometry to Test Your Beeswax Products

Whatever your ideal wax color is, a spectrophotometer will obtain a precise reading that can then be compared to all of your future wax ingredients; once you have a color standard set, you can use the spectrophotometer to test that every batch of your raw beeswax falls within color tolerance. You also have a choice between testing the color of your beeswax while in its natural solid state or in liquid form, both of which have their benefits:

Testing Liquid Wax

The advantage of testing your wax while it's a liquid is that you may save time by not having to wait for the wax to harden completely. When you filter your wax, you must melt it down into a liquid and send it through a filtering mechanism. When you use a spectrophotometer that's capable of testing the color of liquid products, you can immediately test a small sample of your recently-filtered wax to determine whether it has been filtered enough. If it needs more filtering, you don't have to spend additional time re-melting it, as you may be able to send it immediately back through the filter.

Wax is fairly translucent when it's in its liquid state, so [HunterLab's Vista spectrophotometer](#) may be the best choice for your products. Not only is the instrument capable of testing color and haze simultaneously, it also has a full range of color scales, including the Gardner Color Scale, which is especially useful for identifying the color of yellow products like beeswax.

Testing Solid Wax

While some prefer to analyze liquid, wax hardens fairly quickly, and this may make it challenging to clean your spectrophotometer's sample holder after you measure your beeswax products in a liquid state. Instead, you have the option of testing your wax in its solid state. By testing your beeswax after it has hardened, you may save time prepping your instrument and cleaning up after every measurement.

For many, the best spectrophotometer for testing the color of solid beeswax is [the Aeros](#). One benefit of the Aeros is that it is designed specifically for textured samples, like beeswax pellets and other small, rough chunks of wax. This instrument also has the largest sample platform in the world, meaning that it can test hundreds of small beeswax pellets at once. The instrument works by automatically adjusting its height to account for the texture variation of the sample, rotating its platform, and taking multiple measurements in fast succession. The Aeros then averages these measurements to get an accurate color reading for the entire batch.

By testing a large sample of beeswax, you not only save yourself the time and labor of taking multiple measurements of smaller samples, you also can get a more accurate result that is representative of your entire batch of product. This, in turn, produces reliable beeswax colors that significantly improve the consistency and aesthetic appeal of your products.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-pharmaceuticals/spectrophotometers-help-create-color-consistency-in-beeswax/>