



Manufacturers must produce large amounts of consistently colored leather for furniture covers.
Image Credit: Unsplash user Lauren Mancke

Manufacturers of leather covers for residential and commercial furniture understand the importance of [color consistency in their products](#). Their customers themselves depend on this consistency to manufacture their products. Furniture makers expect to be able to produce thousands of identical pieces to ship to their distributors, often to be sold as sets of dozens or hundreds. Without consistent coloration over large amounts of leather, this simply isn't possible. For leather manufacturers, this means that if they can't produce consistently colored leather, they'll lose market share to a company which can.

Leather Substrate Difficulties Impact Dye Color Consistency

Achieving a consistent dye color on leather substrate is easier said than done. Structural differences such as the grain, whorls, and folds prevent an even dispersion of dye.¹ The electrical affinity of the leather can also affect dye consistency, as well as the electrical properties of the dye mixture itself. Because different dye mixtures have different molecular shapes and therefore electrical properties, there is no "one size fits all" solution. Each dye mixture must be applied according to its unique properties.

Additionally, improperly prepared dye mixtures can affect color dispersion and fastness.² Incorrect temperatures during the dyeing process can prevent dye saturation. Submersion in dyebath solutions with overly acidic or basic pH can reduce dye penetration. Too short or long of a drum cycle can result in a paler or deeper shade than desired. Other factors, such as water quality, washing and pre-treatment, dye room contamination, and post-dye processes like drying can affect color as well.



Dozens or hundreds of pieces of office furniture must be made of the same color leather. Image Credit: Flickr User Thomas Quine

Spectrophotometers Ensure Leather Color Quality Control

With so many challenges inherent to the material, leather manufacturers without rigorous quality control processes risk shipping products that will be rejected by their customers. Returned products can add significant costs, including the cost of reprocessing, and cause reputational damage. To ensure that products live up to customer expectations, leather manufacturers are increasingly turning to spectrophotometric color measurement to determine if each batch of leather consistently falls within color tolerance standards. By using spectrophotometers, manufacturers can eliminate the risk of shipping unacceptable leather to furniture makers.

Spectrophotometers measure color simply and efficiently by assessing the wavelengths of reflected light. While the optical science behind the measurements is complex, the process of measurement is remarkably straightforward. Leather samples are placed in the instrument's compartment, then a technician presses a button on the display. The instrument emits a controlled burst of light and analyzes its reflection, then the instrument informs the technician whether the sample is within the tolerance standards. The entire process takes a matter of seconds. Manufacturers can also [employ handheld spectrophotometers](#) for even more rapid measurement. These instruments can be used directly on large sheets of leather, eliminating the need to cut samples.



Spectrophotometers allow for the highest level of color quality control in leather production. Image Source: Flickr user Sebastiaan ter Burg

The Power of Color Quality Control Software

The effectiveness of spectrophotometric measurement for leather furniture production largely depends on the [color quality control software](#) that power the instruments. This software is capable of storing [numerous tolerance standards](#) for comparison, allowing manufacturers to measure against the exact color the customer requests. To ensure the color is exact, it is expressed numerically to make it legible within a [universally understood language of color](#). Furthermore, color measurement software is capable of [averaging together multiple measurements](#). This is useful when measuring large amounts of leather to determine whether entire sheets fall within tolerance standards, not just small portions of it.

HunterLab Quality

With over six decades of experience designing color quality control solutions for leather manufacturers and the textile industry writ large, HunterLab has the expertise to help your company achieve a higher level of color consistency in your products. Our state-of-the-art spectrophotometers, combined with our EasyMatch QC software, work rapidly and accurately to identify the color of any leather product. [Contact us](#) to learn more about how our innovative product range can improve your process and let us help you select the right tools for your needs.

1. "Dyeing Process," <http://dyes-pigments.standardcon.com/dyeing-process.html>
2. "Dyeing Protein Substrates (Leather)",
2003, http://www.swsystemlogic.com/swsystem/leather_dyeing.htm