

Why

Digital

Color Management

Matters in the

Textile and Apparel

Industry



A single garment's long and winding road to retail stores is fraught with obstacles that threaten speed to market. Chief among them is color. The rise of fast fashion — and the attendant pressure to chase trends and deliver on consumer demand — has illuminated the roadblocks brands face in controlling color quickly and cost-effectively, without compromising on quality.

The unreliable nature of visual color evaluation can wreak havoc on the design-to-consumer cycle. A single misstep can reverberate throughout the supply chain, derailing the most well-planned development calendar. If speed to market is the prevailing pressure point, getting color right at the outset is critical.

But, how can we get color right if we all see color differently?

How We Perceive Color: Let's Agree to Disagree

If ten people look at the same color sample, they're likely to perceive that color in exactly ten different ways. How we interpret color is a highly subjective, [complex process](#), and it varies from person to person, retina to retina.

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Trichromatic Theory

Photoreceptors in our eyes send signals to the brain, allowing us to see shades of gray. According to [trichromatic theory](#), cone cells in the retina respond to three wavelengths: red, green and blue. Combined, this trio produces all of the colors that humans are capable of perceiving, as many as seven million unique hues.



Impact of External Factors

Beyond what's happening behind the retina, myriad factors, from [lighting and altitude](#) to [mood and medications](#), influence how we perceive color. When we view a color sample against two different backgrounds, [optical illusions](#) dramatically alter our perception of that color. When we consult our memory, we apply preconceived notions to a color; we might identify an orange-yellow hue as "orange" when we see it on a carrot, yet we'll call that same orange-yellow hue "yellow" when we see it on a banana.

It's no wonder colleagues across the supply chain, including designers, color specialists and lab experts, have a hard time delivering consistent color from ideation to the mill to the showroom floor.



Challenges of Getting Color Right in the Textile and Apparel Industry

With the globalization of apparel production, a single garment may be assembled from various pieces dyed by different suppliers, often across multiple continents. Maintaining quality control throughout the production cycle is akin to juggling 20 objects at once — and never letting any of them fall. Nowhere is this more apparent than with color. A look at the typical production cycle of a garment makes it abundantly clear what can go wrong without digital color management tools designed to turn subjective into objective.



Designer

Color Team

Color Inspiration Turns into Color Standards

It all starts with a spark. Designers draw inspiration from the runway, travel and trends; then they collaborate with the color palette team to translate that artistic vision into an official color palette. The product team defines color standards, evaluating material and fit. Sometimes, a specific color just won't work on a specific fabric. So, it's back to the drawing board. We've heard from some **Datacolor** customers that only 25 to 30 percent of colors that emerge from the design team actually become production orders.

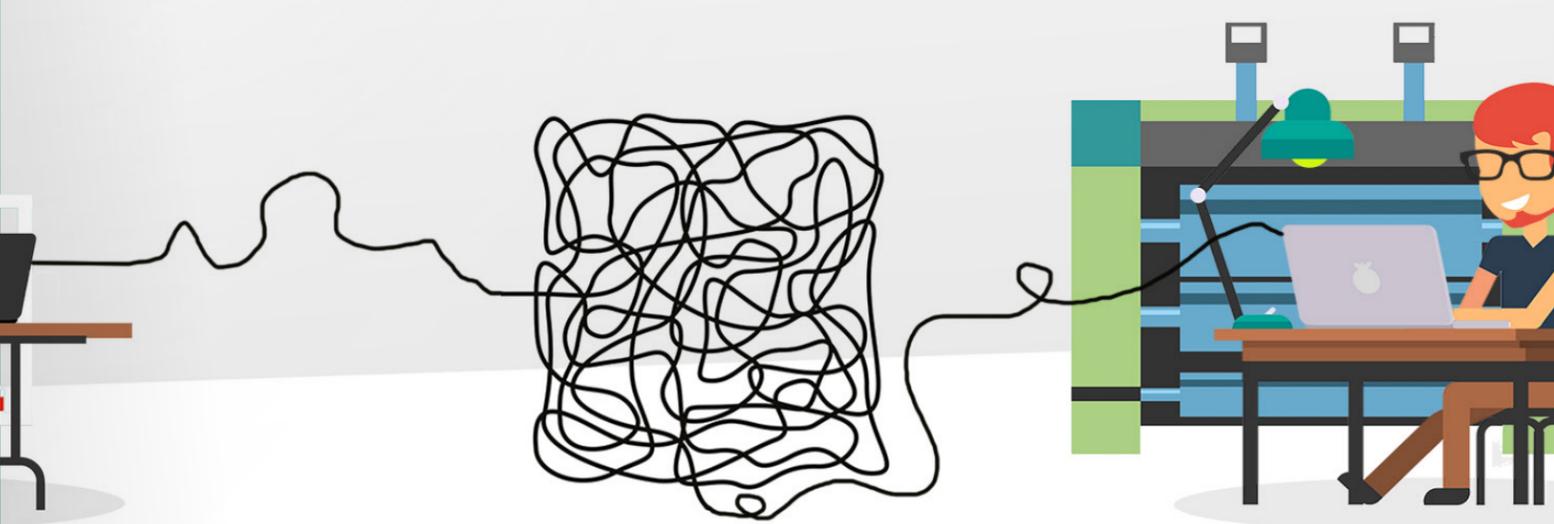
Color Samples are Dyed

Before production can move forward, the fabric is dyed to formulate a color sample. It's common for designers to request pre-dips for each color, but there's rarely enough time for that. Likewise, inconsistencies in color perception may require multiple rounds of samples to gain consensus on a lab dip, further hampering speed to market. When a sample is finally approved, the mill is charged with meeting the established design and color expectations, often relying on subjective methods of color evaluation.

Communication Via Spreadsheets, Emails and More

All the while, a flurry of communication runs in the background via spreadsheets, emails and phone calls, leaving the process vulnerable to human error and miscommunication — particularly when time is of the essence. A recent [McKinsey report on the State of Fashion](#) noted 80% of survey respondents have worked on or are currently working on improving speed to market. Not surprisingly, immense time pressure leads to rushed decisions — and, inevitably, inaccuracies that must be corrected — which, in turn, accelerates an already-crunched timetable.

Manufacturer



A Better Way: Using Digital Tools to Streamline Color Control

We know color is critical, but how can technology transform the production cycle to match the pace of fashion? When sophisticated color management instruments, software and solutions are utilized across the spectrum of high-stakes decision-making moments, costly missteps can be avoided.

Digital color management brings objectivity — and, therefore, consistency — to an otherwise highly subjective process. With the right tools and processes, that single garment made of multiple components from around the world can appear on the rack exactly as the designer intended.

Getting Designers and Color Teams on the Same Page

During the concept phase, tools like [on-screen visualization software](#) paired with a calibrated monitor can help the color team identify the precise hue a designer envisions and determine whether or not that specific color can be achieved on a

chosen substrate. Gaining that [vital directional guidance](#) early on eliminates the pursuit of unattainable color and fabric combinations, saving time and money.

Making Data-Backed Decisions about Color

When [colorimetric data](#) is used to establish color standards, the foundation is laid for consistency throughout the supply chain. In the lab, [a spectrophotometer](#) measures the results of the dyed fabric, comparing it to the standard, and samples are viewed under a lightbox that simulates the lighting conditions of the retail environment. By assigning precise, repeatable, objective characteristics to color, these specialized instruments and software solutions transform the measurement process, facilitating

streamlined communication and greater transparency between brands and mills.

A Coordinated Effort on a Global Scale

Apparel production doesn't happen in a single office, country, or even continent. From regional brand color offices to suppliers around the world, it's critical that all players speak the same language around color. Having a consistent fleet of ([well-maintained](#)) instruments and software throughout the supply chain means that geography will not get in the way of accurate, on-time production.

It's impossible to control what you can't see, which makes it so important to implement solutions that bring transparency to the supply chain. Consistent color across the supply chain means brands can rest easy knowing costly samples won't have to be redone, the production calendar won't be compromised, and the finished product will deliver a perfect color match on retail shelves. Beyond cost-efficiency, effective color management also plays a role in advancing sustainability initiatives, as part of a larger coordinated effort to reduce environmental impacts.



The Color Piece of the Sustainability Puzzle

Businesses across every sector are looking for ways to reduce waste, minimize carbon emissions and implement sustainable practices across supply chains.

☞ [The United Nations Environment Programme](#) recently noted the fashion industry is responsible for 20 percent of global wastewater and 10 percent of global carbon emissions, more than all international flights and maritime shipping combined. Given that it takes about **7570 litres (2,000 gallons) of water to produce a single pair of jeans**, textile dyeing is the second largest polluter of water around the globe.



How does color management play a role in reducing environmental impacts? Getting color right the first time means eliminating the need for multiple lab dips and the subsequent waste produced by dyeing physical samples (not to mention discarding those unacceptable samples). And, instead of shipping samples overseas for evaluation — turning up the notch on fuel use and carbon emissions — brands and mills can communicate color decisions digitally, achieving greater accuracy while leaving a smaller carbon footprint.

The Right Process Meets the Right Tools

Color poses challenges at every stage of the ☞ [design-to-consumer cycle](#), as teams work to make critical decisions that impact cost, timing and quality. From inspiration to formulation, production and delivery, there's a **Datacolor solution** for each spoke in the production wheel. Designers can speed up palette creation by scanning any object with the ☞ [ColorReaderPRO](#), a portable device that identifies colors across major color standard libraries.

Building on the decision-making power behind our spectrophotometer, the ☞ [Datacolor SpectraVision](#) objectively measures and digitally communicates the colors of prints, trims, yarn, laces and other previously unmeasurable components.

On the software side, ☞ [Datacolor Match Textile](#) enhances the accuracy and speed of recipe calculation, providing superior first-shot matches. Meanwhile, lab equipment like the ☞ [AUTOLAB TF](#) automatically dispenses dye recipes and helps avoid expensive re-dyes.





Brands like [s.Oliver](#) and [Hugo Boss](#) have used **Datacolor** tools to transform the way they control color, realizing tremendous cost and time savings, while delivering the utmost quality to consumers.

Beyond hardware, software and state-of-the-art equipment, our team of experts also can provide [color assessments and lab audits](#) to help brands and mills troubleshoot challenges on the road to **gaining greater transparency** and **streamlining the color management process**.

When it comes to cost, quality and speed to market, your approach to managing color can make a world of difference. Our global team is here to help you get it right.



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