

THE SECOND C: The Ninth Sphere of Paradise— Primum Mobile, Part 4

By Keith Hoover

“...the fated season, long awaited, will reverse stem to stern, so that the fleet can sail true: and ripe fruit will follow the flower.”

—Dante Alighieri, *Divine Comedy, Paradiso, Canto XXVII*

In the past three installments, we reviewed the Color Accreditation Program (CAP) as the centerpiece of a Digital Solid Color Management (DSCM) project, a better process to assure the right color and learn from production color data. That’s all well and good, but what does it take to implement? Is this process only for big brands with separate color teams, lots of expensive spectrophotometers, and people who are experts in color science?

DSCM can be implemented in any organization that manages color internally, big or small. In order to benefit, a brand must shift from *doing stupid faster* to *doing what needs to be done*. Ironically, making these changes can be more difficult for organizations that dedicate a lot of resources for a color department than for those that do not. Inertia (and pride) is a hard thing to address.

Change requires preparation, planning, and leadership. And improving color management involves more than procuring hardware and software. This article provides a project template for implementing the Digital Solid Color Management (DSCM) project using the project management phase approach:

- **Phase 1:** Project Initiation & Planning
- **Phase 2:** Project Execution
- **Phase 3:** Project Monitoring & Control
- **Phase 4:** Project Close Out

THE PROJECT: DIGITAL SOLID COLOR MANAGEMENT

The first project in the Digital Color Management Program¹ focuses on solid color garments (piece/exhaust or continuous dyed fabric and yarn) without intentional color loss due to wash processes.

The Digital Solid Color Management (DSCM) project addresses three phases:

1. **Color review at the brand:**
Improve existing lab dip approval competency by implementing and training with an Interim Optimized Lab dip Evaluation (IOLE) process at the brand.
2. **Color approval at the garment vendor:**
Assign color approval to garment factories by implementing Garment Vendor Color Certification (GVCC).
3. **Color approval at the fabric mill:**
Eliminate the lab dip process and provide transparency on all production color quality data by implementing the Color Accreditation Program (CAP) at the mills.

The following sections describe actions and information required for the project.

BRAND SOURCING VENDOR MILL



Color specification process



The color execution process

Phase 1: Project Initiation & Planning—Define the Baseline: Document and Evaluate

Brand IT Systems and Data: Meet with the brand IT team and document all policies to understand how they might impact the implementation of color-related digital technology across the enterprise.

Identify the system of record—product lifecycle management/product data management (PLM/PDM)—for associating colors with fabrics, which is the basis for triggering lab dip requests. Collect data from PLM/PDM and various documents to establish 1) the annual volume of the colors/fabrics and mills that fall within scope and 2) the number of brand associates and time required to manage color in the status quo.

Execute an additional review to evaluate reporting system functionality (work-in-progress (WIP) tracking, where used, approval carryover, communication, etc.) in order to understand the expectations of the current color process.

Processes: This phase involves documenting the color-related procedures and practices involved in the current color process. Document or describe current roles and responsibilities of those involved in the color process and create a RACI (Responsive, Accountable, Consulted, and Informed) chart to reflect the current structure. These workflow diagrams or equivalent documentation serve as the baseline for comparison when new processes are proposed and analyzed.

Color Assets: The key to improving a color management process is to establish a baseline by assessing the quality of existing color approvals. Do the color approvals match the color standard and do the products match each other? Typically, color matches in “visual only” color approval processes show wide and inconsistent variation—and in some cases “official” color standards are *not actually the target for matching*.

The first step is to identify all core colors along with existing lab dip approvals. If lab dip approval samples are not available, then products in those colors can be pulled from all categories. Measure all samples and compare them to the official color standards. Core colors to which products actually match are then validated. Core colors to which products do not match must be re-defined to reflect what is actually in the market. All existing color approvals that fail to match the validated core color standards or fastness requirements are rescinded.

Colorfastness is also a function of color, since the “durability” of color to sun, laundering, and rubbing is determined by the dyes in use. Collect and evaluate brand fastness requirements for reasonableness. Collect and evaluate all existing fastness test reports for compliance with fastness requirements. If the test reports are not available, then test and evaluate key product/colors. Based on the analysis, either confirm or amend fastness specifications to meet reasonable requirements.

Digital color approval—or “color by numbers”—might not be a familiar concept in various departments within a brand. Assemble several samples of colors approved digitally and visually to demonstrate the validity and superiority of the digital approach.

This textile series will share technical insights and wisdom of AATCC members. The “Second C” series will focus on color. If you wish to contribute your own technical insights on topics of interest to AATCC members, contact Communications Director, Maria Thiry; thiry@m@aatcc.org.



Supply Chain: Identify and poll all garment vendors to determine their approach to managing color. This involves documenting the stages where color is assessed (lab dips, SMS, production) as well as the resources and technology devoted to color management. Cross-check the garment vendor list to determine if any are already GVCC-certified with other brands.

Communicate with the garment vendors to create a mill matrix of fabric suppliers. Contact those mills to determine their digital color technology adoption level. Cross-check the mill matrix to determine if any are already CAP-certified with other brands.

Color Resource Providers: Identify and Evaluate

Identify legitimate color standards providers. Candidates must provide master spectral data and certified swatches—or something better [4]. The standards must be matchable, both in shade and fastness. Experience has shown that many color standards are not suitable for use because of limitations in some fiber types or finishes. A method must be used to pre-qualify colors for use, furnished either by the color standards provider or by a third-party resource like Natick.

Digitization requires hardware and software such as spectrophotometers and color software to both evaluate digital color and communicate color-related tasks within the product development process. Identify and evaluate all hardware and software providers for best fit within the brand design and IT environments.

Results from the brand systems analysis will determine the best way to communicate lab dip requests (either directly or through an external system connected via an API) to garment vendors and mills responsible for execution. Such a system not only transmits lab dip requests directly to the supply chain, but also provides work-in-progress (WIP) tracking that updates the approval status and color quality data for all color development requests. Systems-driven reporting is critical to a digital color process.

Gather Stakeholder Input

Brand: Interview key stakeholders in management, design, product development, merchandising, sustainability, sourcing, quality, and IT to document their feelings about the current process and what is desired in a digital alternative.

Garment vendors: Poll all agents and garment vendors identified in the “Supply Chain” subsection for input regarding color management best practices and requirements for simple and efficient communication.

Mills: In addition to the information gathered in the “Supply Chain” subsection, all mills and dyehouses must be advised about the project and encouraged to contribute suggestions to keep the process simple and meaningful.

Draft SOPs

Since existing internal color review will continue until alternate processes are in place, draft the Internal Optimized Lab Dip Evaluation (IOLE) process to reflect color approval best practices in place across the apparel industry. This facilitates improved internal color approval across the company.

The GVCC and CAP processes are outlined in detail. To be effective, they must be adapted to work in the brand environment. In light of new environmental transparency regulations on the horizon, any requirements based on new sustainability policies must be factored into the model and roll-out of these programs.

Draft Corporate Color Process and Policy

Changes in the color approval process will have implications across the organization and supply chain. First, update, drop, or rewrite the existing processes identified in the “Processes” subsection to reflect new or different activities. Draft RACI charts and roles and responsibilities documentation that impact job descriptions, garment vendor contracts, regulatory compliance, marketing, and budgets. Update training programs or portals, either internal or external.

Stakeholder Alignment

Brand: Create resources that explain how a digital color process benefits the brand and present them to key stakeholders in management, design, product development, merchandising, sustainability, sourcing, quality, and IT.

Garment vendors: Brief all agents and garment vendors identified in the “Supply Chain” subsection on the DSCM project content and explain its implementation. Create and distribute documents to the garment vendors, along with online technical presentation sessions. Encourage garment vendors that deal with CAP-certified mills to participate as presenters in these sessions.

Mills: Create and distribute documents and technical SOPs to the mills identified in the “Supply Chain” subsection, along with online technical presentation sessions. Recruit mills that are currently CAP-certified for other brands to participate as presenters in these sessions.

Training

Brand: Train all team members involved with color on the new procedures prior to project execution. There are three tracks: 1) Following the IOLE process for garment vendors that are not yet GVCC certified, 2) using GVCC data for color process monitoring, and 3) using CAP data for color process monitoring. These processes and procedures should conform with existing practices where possible and eliminate tasks where feasible. Identify key brand project advocates in design, product development, sourcing, and quality to facilitate communication and project implementation.

- Draft a “Brand Digital Color Process Manual” defining all requirements and processes for 1) IOLE color approval, 2) GVCC conformance, and 3) CAP conformance.
- **Garment vendors:** Distribute all documentation covered in the “Stakeholder Alignment” subsection.
- **Mills:** Distribute all documentation covered in the “Stakeholder Alignment” subsection.

Phase 2: Project Execution—IOLE

Lab dips from garment vendors not yet GVCC-certified will be processed by the same brand team members currently reviewing color but following the IOLE process. Implementing process improvements begins immediately—even prior to the adoption of a color system integrated with PLM/PDM.

CERTIFICATION

GVCC: The GVCC forms the foundation of the brand’s approach to assigning color approval responsibilities to

garment vendors. The focus of the project is to delegate the brand’s internal conventional lab dip process to garment vendors.

Adopt a policy requiring garment vendors producing a pre-defined minimum production volume to be GVCC-certified. Direct these garment vendors to go through GVCC certification. Any garment vendor already GVCC-certified (by another brand) will qualify as approved.

Enroll all garment vendors in the GVCC. Prioritize garment vendors certification based on internal strategy criteria.

CAP: Natic’s Color Accreditation Program (CAP) forms the foundation of the brand’s digital color management project (see The Second C: The Ninth Sphere of Heaven—Primum Mobile, parts 1 and 2). The focus of the project is not to digitize the conventional lab dip process, but rather to eliminate it.

Since garment vendors own the responsibility and burden of color approval, they should evangelize the CAP process to their mill matrix. Ideally, they will adopt a policy requiring mills producing a pre-defined minimum production volume to be CAP-certified. Any mills already CAP-certified (by another brand) will qualify as approved.

LAUNCH

The GVCC and CAP certification processes will require several months to complete. However, it is likely that some garment vendors are already GVCC-certified for other brands and some mills are already CAP-certified for other brands. Rather than wait for all garment vendors and mills to complete certification to start the new process, leverage the competency of pre-certified garment vendors and mills to immediately kick-start the new process.

- Garment vendors with existing GVCC certifications can begin the new color process as soon as either 1) a color system is integrated with the PLM/PDM or 2) an interim process is established to communicate color match requests and results.
- Garment vendors without existing GVCC certification can follow the Interim Optimized Lab Dip Evaluation (IOLE) process until they are GVCC-certified.
- Revisions to official color standards and fastness requirements resulting from the “Core Color Standards Analysis” replace old standards.
- All lab dip match requests are communicated to the garment vendors via the new color system integrated with PLM/PDM.

- Brand color reviewers follow the Interim Optimized Lab Dip Evaluation (IOLE) process and enter their pass/fail decisions in the new color system integrated with PLM/PDM.

Phase 3: Project Monitoring & Control—IOLE

The key project advocates will participate in scheduled monitoring and control meetings as well as communicate issues to the project manager as they occur.

Brand IT

IT associates will monitor compliance with IT policies and assist in troubleshooting, if necessary.

Garment Vendors

GVCC-certified: Garment vendor performance is monitored by the brand using the CAP Database, a platform to which all garment vendor color approvals are posted. An exception management process is followed, focusing only on approvals that fall out of tolerance.[3]

All production color management will continue to be managed by garment vendors, who remain responsible for final product quality. Garment vendors will be encouraged to subscribe to the CAP Database Network,[4] a platform

they can use to monitor the production color quality of CAP mills that provide them with finished fabric.

In-process GVCC-certified: Certification progress will be monitored with certification providers. Frequent updates and communication with garment vendors must be in place as the program starts up. All issues are communicated to the project manager.

Mills

CAP Mills: CAP mill performance is monitored by the brand and relevant garment vendors using the CAP Database, a platform to which all production color measurements are posted.[3] An exception management process is followed, focusing only on production lots that fall out of tolerance.

CAP Mills In-Progress: Lab dip performance by mills awaiting CAP certification is monitored with systems-driven reporting from either the PLM/PDM or the new color system integrated with PLM/PDM. Key brand team members in each area (design, product development, sourcing, and quality) meet regularly to discuss progress and problems. Frequent updates and communication with the mills must be in place as the program starts up. All issues are communicated to the project manager.





Phase 4: Project Close Out—Hasta La Vista, Baby

After all garment vendors are GVCC-certified, then the focus changes to driving CAP certification at the mill level. When all certifications are complete, the project ends. A closure meeting is then held with all key stakeholders to discuss successes, failures, and ideas for improvement. When all information has been received and digested, a final report is issued. Additionally, all process documentation is logged for future access.

While this project is ongoing, additional project planning is underway to address 1) Digital Washed Color (DWC), 2) Digital Print Color (DPC), and 3) Digital Complex Fabric Color (DCFC).

DSCM Project Duration: 24 Months

- Draft DSCM Project Definition and Charter (dependency): 2 months
- Draft Interim Optimized Lab dip Evaluation (IOLE) Process: 3 months
- GVCC Implementation: 2 to 22 months
- Pre-certified garment vendors: 1 month
- Non GVCC-certified garment vendors: 6 to 24 months
- CAP Implementation: 2 to 22 months
- Pre-certified mills: 1 month
- Non CAP-certified mills: 6 to 24 months
- DSCM Project Planning Through Close Out: 24 months

COUNTING THE COST

Making the case for a project such as DSCM requires an understanding of the project cost, but also the cost of the status quo. Every existing product development process carries a cost. In the next article, we will explain how to count the cost of the current process and calculate savings from process improvements.



Notes

1. Digital Color Management (DCM) is an overarching program incorporating several projects that focus on the various types of color application for apparel products, including Digital Solid Color Management (DSCM), Digital Washed Color (DWC), Digital Print Color (DPC), and Digital Complex Fabric Color (DCFC).
2. Such as LED Simulator by Thouslite, https://thouslite.com/product_detail/169.html
3. The CAP Database is also known as the Natick ColorWarehouse
4. The CAP Database Network is also known as the Natick ColorWarehouse Network (CWN)

Keith Hoover, President of Black Swan Textiles, implements manufacturing-centric digital processes for color and fabric development. He has implemented digital color management programs for Ralph Lauren, Target, Lands' End, JCPenney, and Under Armour, ultimately leading to a process that eliminated lab dips altogether. At Under Armour, Hoover championed the UA Lighthouse, driving digitalization and advanced manufacturing processes to explore local-for-local sourcing. He has worked hands-on in mills worldwide and is a frequent AATCC presenter.

Disclaimer: Responsibility for opinions expressed in this article is that of the author and quoted persons, not of AATCC. Mention of any trade name or proprietary product in AATCC Review does not constitute a guarantee or warranty of the product by AATCC and does not imply its approval or the exclusion of other products that may also be suitable.