

Managing Coatings Color Control In a Distributed Manufacturing Environment

An interview with Dudley Boden, General Manager, Instrument Systems Division, Minolta Corporation on color management in today's globally distributed manufacturing platform.

Color management in a globally distributed manufacturing platform presents new challenges for multinational corporations. The tools have become easier to use and more cost effective, but according to Dudley Boden, the challenges go beyond providing good color management systems.

IL: *How have distributed manufacturing techniques affected the coatings industry?*

DB: This globally distributed platform gives rise to new color communication issues and manufacturing issues once handled within a single location. Color is becoming mission critical. Today's fast-paced coatings industry relies on first-hit matches. And matching isn't limited to coatings. Often the coating is expected to match another coating process (powder vs. liquid) or a completely different material such as a plastic component part.

Distributed manufacturing platforms necessitate database consolidation of colorant and formula libraries. This ensures color consistency throughout all manufacturing facilities and allows for substitution of colorants and resin systems due to environmental regulations, product availability within a specific geographic region and other distribution issues. When you consider the recent merger and acquisition activity over the past few years, consolidation of database files is even more important for product consistency without sacrificing production throughput. A centralized database that's shared across global manufacturing facilities, reduces costly time and materials

waste while diminishing the risk of off-color batches. A well-maintained centralized database makes on-demand production possible and facilitates fast digital color communication.

IL: *Color Formulation systems have existed for many years. What's changed to address the new manufacturing paradigm?*

DB: Today's systems are much more intuitive to use than their predecessor systems. The flexible Windows interface delivers simple point and click access to formulations. It enhances productivity by allowing personalized configurations for access to features based on the operator's level of experience. This means that more technicians can use the system in more ways.

For example, a less experienced technician can have the system configured only for recalling existing formulations for repeat jobs. At the same time, a more experienced technician can access colorant libraries and manual matching features to formulate for more challenging jobs such as matching a legacy system color with new environmentally friendly colorants. Both technicians can utilize the system differently, which helps them maintain throughput. The end-user has more control over the application and the way information is presented.

The mathematical models have been updated to allow for items such as film thickness, alternate colorant/resin systems and bulking up laboratory formulations for accurate color in production volumes.

In addition, the software is designed to run on client/server information system architecture making it conducive to distributed manufacturing platforms.

IL: *Has the hardware undergone changes with regard to distributed manufacturing?*

DB: Given the global nature of the color communication and coatings manufacturing processes, accurate measurements are more important than ever before. At Minolta, we've utilized Enhanced Performance Technology™ to guarantee instrument agreement throughout our diverse product line. Enhanced Performance Technology™ removes instrument variability as an obstacle to accurate color matches and lets color matchers focus on the process.

What we want for our customers is a measurement device that's as seamless to use as a ruler. If you're asked to measure 3 cm with a ruler in five different countries, one disputes that that 3 cm on one ruler is different than 3 cm measured on any other ruler. The same holds true for our color measurement devices – they provide measurement agreement throughout the product line and across the globe.

IL: *You mentioned that color is “mission critical.” Can you elaborate on that?*

DB: Referring to color as mission critical means that color, among other variables can be the deciding factor in proceeding with or halting full-scale production. And aggressive speed-to-market goals in a distributed manufacturing environment have little tolerance for production delays.

Consider the appliance industry. A liquid-coated subassembly may have to match another subassembly finished with a powder coating and perhaps even a molded plastic component part. Color is monitored at each phase in the production of each subassembly or component and communicated to a central quality control hub for final approval. Color is an integral part of this carefully orchestrated process. An off-spec

color can delay the entire process. What's worse, a process that's *not* under close scrutiny for meeting color specifications can cause millions of dollars in wasted time, materials and profits – that's mission critical!

IL: *What's driving this need for color control?*

DB: It's difficult to pinpoint a single definitive factor. I think there are several influences: consumers, manufacturers of consumer brands, and technology.

Consumers have changing tastes for new and different things such as lime green computers. They may prefer something consistent and stable such as neutral color interior house paint. Whatever the reason, manufacturers must try to meet this changing dynamic. Color management systems help companies rapidly deploy new color palettes while consistently maintaining existing palettes.

In some cases, the manufacturers of consumer brands utilize color to strengthen brand affinity and awareness, as is the case with a major global brand of laundry detergent that uses a bright orange bottle. Color can also be used to repackage and stir renewed interest in an existing brand, similar to the computer example previously mentioned. Color management systems help companies maintain a consistent brand image across a variety of different media.

Finally, technology plays a large role in making it possible to produce and control these colors. The Internet along with computer networks (LAN/WAN) and distributed software applications have made global sourcing and productivity gains a reality even small to mid-sized companies.

IL: *What skills are needed to address color control in a distributed manufacturing environment?*

DB: Color communication is *vital*. Today's color matching technicians, laboratory and production managers require a general understanding of color theory and application to effectively communicate color. Unfortunately, most of this training is obtained on-the-job... often through costly, time-consuming trial and error. Basic items such as interpreting color reflectance curves, translating numeric color space or color difference equations into production process variables and correlating numeric color simulation to visual tolerances can make a difference in process efficiencies.

IL: *Where can technicians and managers learn more about color?*

DB: There are several color courses available. At Minolta's Light Color and Applications Center (LCAC), we've taken a holistic approach to color education by offering assistance from general color courses to customer-configured color consulting. For companies involved in distributed manufacturing platforms, we conduct a course at their facility that includes their global manufacturing partners.

IL: *Theoretically, color management in a distributed manufacturing environment makes sense. Do you have any actual cases where this is working today?*

DB: One case immediately comes to mind – our parent company, Minolta, Japan. Minolta manufactures and markets over \$5 Billion in consumer, business, medical, scientific and industrial products. We take it a step further than color control. We also utilize our radiometric light control products to monitor performance quality. All the

while, the Minolta brand color logo is reproduced consistently throughout a variety of different media from product to package.

IL: *Where do you see the future of color management in the paint and coatings industry?*

DB: We're seeing a renewed focus on core competencies and outsourcing those items that are not part of the core competency. In the paint and coatings industry the focus is on the manufacturing and marketing of world-class paint chemistries for consumers, business and industry. Companies that have the resources to hire and retain highly skilled color chemists and technicians will maintain color control as part of their core competency. With the skilled labor shortage and pressure to reduce overhead, companies may turn to outsourcing for color training and expertise.

IL: *What is Minolta doing to address the need?*

DB: Earlier, I mentioned the Light Color and Applications Center (LCAC). We continue to evolve this center around the changing needs of our clients. Whether it's basic color training, advanced color formulation or consulting, we're focused on using our core competency in color, light and appearance to keep business and industry profitable through good color management.

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