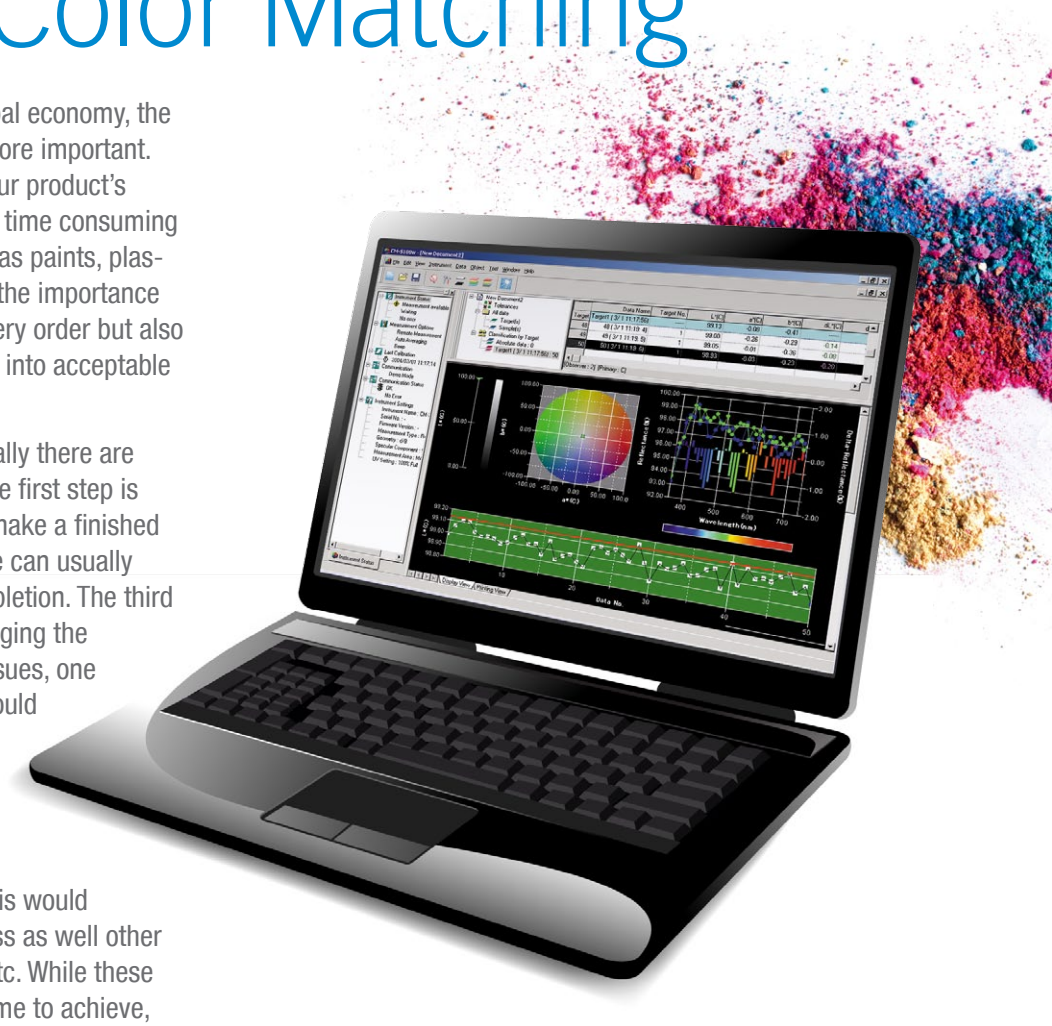
KONICA MINOLTA | SENSING AMERICAS, INC.

THE STANDARD IN MEASURING COLOR

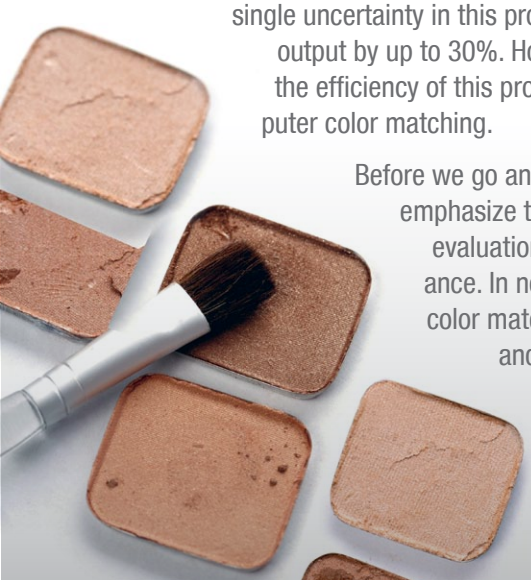
Advantages of Using Computer Color Matching

In today's ever increasing competitive global economy, the maximizing of product output becomes ever more important. For those of us that deal with color as one of our product's critical specifications, this can be a thorny and time consuming issue. Manufacturers that produce items such as paints, plastics, cosmetics and food will attest to not only the importance of having the correct color and appearance every order but also the time it takes to bring the color of a product into acceptable specification limits.



When talking about these industries, typically there are three main steps to the production process. The first step is batching raw materials that are necessary to make a finished product. Barring any unforeseen problems, one can usually certainly estimate the time it will take for completion. The third step, yes we jumped to third, is filling or packaging the finished product. Again, without unexpected issues, one could calculate a fair estimate of the time it would take to finish. The one uncertainty in this process is step number two.

Step number two is the adjustment of the physical properties of the product itself. If we use paint and coatings as an example, this would normally consist of adjusting viscosity and gloss as well other properties such as hardness, flow, adhesion, etc. While these properties usually take a minimal amount of time to achieve, there is another step that can be time consuming: matching the color. If this step is done entirely by eye it becomes the single uncertainty in this process and can decrease output by up to 30%. How can we help maximize the efficiency of this process? We can use computer color matching.



Before we go any further, we need to emphasize the importance of visual evaluation of color and appearance. In no way should computer color matching eliminate the need and usefulness of the human eye. However, one can achieve great improvements in the time it takes to move material through their facility with a properly maintained and running spectrophotometer and color matching software.

Computer color matching typically consists of three components. The first component is a QC module that allows the user to compare samples to one another and calculates a numerical result or difference. Along with this most commonly used function, comes other advantages such as the ability to evaluate and monitor the strength of incoming pigments or colorants. There are also numerous whiteness and yellowness indices that adhere to ASTM standards.

The second component is formulation. This program allows the user to take a colored object, measure it, and uses a file of their pigments, as characterized by them, to come up with single or multiple predictions of pigments to match that object's color. These predictions, or formulas, can usually be sorted by a variety of criteria. Metamerism and cost are typically the most frequently used. These formulations generally offer the user a high quality starting point.

The third module is Batch Correction. This function is very useful for both laboratory and production color correction. As an example, a user receives a customer's sample color to match. A formulation is then run. Because of processing and raw material variables that have taken place since the original pigment characterizations were made and compiled in a library, we have a match that is not absolutely acceptable. Let's say it has a Delta E (total color difference) of 3 units. The target color is read into the correction program along with the sample that was produced from the original formulation prediction and the formula that made that sample is entered. The program then uses this data and calculates a correction, or adjustment, to make to the original formula in order to bring the color "on shade". The same process can be used in manufacturing as well to adjust production materials. What allows this function to perform well is its ability to calculate the differences in pigments or colorants being used today compared to when they were originally characterized in the colorant file. This "performance" data is then applied to the correction so that either less or more of a certain color may be used based on its tintorial and colorimetric differences. Thus, while a human being will tend to err on the side of caution, as they are unable to make those determinations concerning raw material variations, the software will take a more direct approach towards the correcting of the color. However, it is important to stress that the color matcher is still needed in order to make the physical addition of pigment or colorant, prepare a sample, visually evaluate it, and run it on the computer. The entire objective is to make the color matcher's job easier while increasing overall output in both the lab and manufacturing.

In closing, keep in mind that a properly maintained and functioning system will not only improve overall productivity and increase manufacturing volume but will help one maintain a competitive advantage at all times.

For more information about how Konica Minolta can assist you in measuring color and color matching, visit https://sensing.konicaminolta.asia/color-measurement