

# Chroma-Sync

## Accurate Color, all the time - every time

The concept of color management has been around for many years but it is only in the past decade or so that the quality of equipment, computer programs, standardization and the absolute necessity of controlling color accurately from concept to application across a variety of printing platforms has reached a point where such a system is both viable economically and commercially feasible. There are many stakeholders in the process, but from a printing point of view it is the ink on substrate color outcome that is critical. As printers and ink makers it is our collective responsibility to ensure that the corporate color, brand identity requirements or the designer's expectation are fully realized.

### Chroma-Sync

Chroma-Sync is a menu driven, multiple component system designed to match and manage all spot color related factors of printing ink in the printing and converting process. By providing either digital or visual data it is now possible to quantify a specific color, reproduce it in a variety of formats and be able to readily retrieve and match it on demand. Color management in four color process printing is well understood with established systems such as G7<sup>®</sup> and FIRST<sup>®</sup> being used industry wide. To this mix Chroma-Sync 20:20 adds the ability to fully manage and accurately reproduce spot colors in all printing processes that use Zeller+Gmelin inks.

### Components

It is not necessary to have every component of Chroma-Sync available in order to properly manage color. **A complete system catalog includes a Calibrated Spectrophotometer, Scales, Computer, Dispenser, Mixer, Proofer, Software, Standardized Viewing Booth and Eyes.** Depending on the size and complexity of the printing operation; Zeller+Gmelin will design an optimized system for your particular application. Each installed system is designed to be open ended so that additional features can be added as necessary and as business grows.

### The Theory Behind It

Printing is primarily a visual technology. The two necessary key components are image accuracy and color rendition. In its basic analog form, image accuracy is achieved by the ink faithfully reproducing the plate image onto the substrate without growing, shrinking or distorting and providing a smooth non mottled lay-down. Perceived color is created by a combination of three things: a source of light, ink+substrate and a series of receptors in the eye. For the sake of simplicity in this paper we will assume that the eye receptors are in the normal range and only deal with the light source and ink+substrate combinations. It is important to note that color can be shifted by appearance factors such as gloss, matte or over-coating and this must be taken into consideration during the matching process.



Traditionally color matching was (and in many ways remains) a trial and error process that relies on the skills of the specific color matcher. Although the introduction of color swatch books went some way towards achieving standardization, it did not entirely eliminate variation. Indeed, in some cases it created more issues. Color books of differing ages and methods of storage when compared, demonstrated large variations in consistency which frequently resulted in inaccurate color reproduction. What was needed was a practical color "language" that could accurately define a color mathematically and in turn allow us to match the numbers by blending a series of basic colorants together.

The language of color has been developed and refined over the years by many scientific and standards associations. Today the accepted color language for printing is L\*a\*b\* (also known as CIELAB). In effect the language provides a series of coordinates in a similar manner to longitude and latitude numbers identifying a specific location on the surface of our planet. The L\*a\*b\* language goes further. It provides a three dimensional coordinate that places a specific color within the normal "sphere" of visual color rather than just on the surface. In reality the "sphere" is not actually spherical in shape but for visualization purposes it provides a clear picture in order to understand the concept.

Suffice it to say that every color has its own unique L\*a\*b\* number and; providing the reading instrument (spectrophotometer) is calibrated and standardized accurately, a specific color can then be read anywhere in the world and will produce the same number value. Alternatively the numerical data for the defined color can be sent anywhere in the world and be matched using the correct colorants without visually seeing the original color itself. These are the crucial factors in producing accurate color – globally.

## HOW IT WORKS

### Databases

Zeller+Gmelin color technicians have created a series of color databases for a broad variety of UV ink types. Each database is created using the strongest color concentrations possible so that the system provides maximum flexibility in producing highly saturated colors all the way down to the lightest tints. Depending on the print application, these databases take into consideration such differences as ink film thickness (e.g. use of different flexo anilox rollers), permanency restrictions and other end use properties. During the matching process the specific database required is chosen and all matches for the job will then only use ink bases that meet those specific requirements.

### Database Access

Seats - Once enrolled in Chroma-Sync the printer is provided password protected access to the color matching program and databases (the Seat) via a computer and direct connection to our secure server. It is then available to be used by the printer 24 hours per day / 7 days per week. Note: All formula data is strictly the property of the printer and cannot be accessed by a third party.

### Matching

Colors can be matched using a variety of inputs. The key ways are by inputting provided L\*a\*b\* values, accessing the available Pantone® digital color library or by reading a color copy with an X-Rite Exact® spectrophotometer which has been X-RGA calibrated. Once the correct color values and required performance data has been entered into the system the computer provides a series of calculated formula options that offer different priorities. These options include lowest cost, highest accuracy and final application.



### Confirmation

Once the formula has been chosen it is recommended that it be checked, weighed and proofed on the appropriate substrate to ensure accuracy. The proof is read back into the system by the spectrophotometer and compared to the original numbers and/or the color copy provided. If any correction is needed to improve accuracy, the adjustment requirements are provided by the computer as an addition to the original mix.

### Manufacture

Once color approval has been achieved a formula can be issued to manufacture the correct amount of ink for the job. The quantity required can be calculated using the Zeller+Gmelin ink estimator chart available at [www.Zeller-Gmelin.com](http://www.Zeller-Gmelin.com). With a full Chroma-Sync system the formula can then be directly input into the dispenser and the correct amount of ink dispensed without manual intervention. Otherwise the formula can be manually weighed on the linked scale.

### Color Control

Once on press the same spectrophotometer can be used to verify the reproduction accuracy of the color and if necessary the coordinates provided remotely to a customer for approval.

### Why You Need It

Printing on press is the final frontier of color reproduction and all prior steps are meaningless unless the final color produced satisfies the requirements of everyone upstream in the process. A full Color Management system is therefore a vital link in achieving this and offers the following key advantages to you:

- + Speed and economics.
- + On demand availability – no wait.
- + Manage excess ink inventory.
- + No blending charge – price is that of bulk standard products.
- + Never run out of ink – make just enough/ just in time.
- + 100% reproducibility and color accuracy.
- + Accurate per job usage history.
- + Color O.K. online – no need for press check.

### Plans and Packages

Menu driven by specific requirements and demand. Consult your Zeller+Gmelin representative for further details including pricing and other application options. Following are some core package options:

- + Hard copy formula book + Scale  
(No computer seat)
- + Hard copy formula book + Scale  
+ Proofer (No computer seat)
- + Computer + Seat + Scale
- + Computer + Seat + Scale + Proofer  
(Recommended)
- + Spectrophotometer + Computer  
+ Seat + Scale + Proofer
- + Spectrophotometer + Computer  
+ Seat + Software
- + Scale + Proofer

