Introduction

The purpose of this guide is to provide a set of practical color handling techniques and setting recommendations for Epson SureColor F-Series dye-sublimation printers in order to achieve consistent color output.
Table of Contents

- Color Management Considerations (Page 4)
- Calibrating Color (Page 8)
- Spot Color Tools (Page 19)
- Color Enhancements (Page 24)
- Simulating colors of a different printer (Page 28)
- Recommendations for Creating Profiles (Page 30)
Dye Sublimation Color Management involves **MORE** than ICC Profiles and Software Settings.

Color management processes that closely manage all aspects of a production workflow will produce accurate and consistent results.

Color management will not fix print quality issues of a poorly managed production workflow.
Create a control plan that documents the following:
- Software Settings
- Environmental Conditions
- Printer Settings
- Printer Maintenance Routine Checklist
- Heat Press Temperature Calibration
- Heat Press Settings
- Operator Procedures
- Consumables / Material information log
Prerequisites

Ensure that the printer is in good working condition and the media parameters are setup correctly before modifying system settings.

• Load appropriate transfer paper on the printer
• Perform a nozzle check, and if necessary any cleaning or maintenance before proceeding
• Verify media settings
  – Platen Gap
  – After Heater Temperature
  – Head Alignments (Uni-D, Bi-D, and Dual Head if applicable)
  – Feed Adjustment
  – Media Feed-In / Take-Up Tension

Measurement Tool Needed:
• Spectrophotometer (X-Rite i1 Pro2 model is recommended)
Color reproduction is greatly affected by heat press parameters (time, temperature, and pressure). To have consistent color reproduction, the heat press parameters need to be maintained.

To determine the heat press temperature:

- Attach a temperature sensitive strip to the sublimation substrate and run through transfer process.
- The temperature strip will indicate the actual heat level reached.
- If measured temperature differs from expected, adjust the heat press settings until desired temperature is achieved (Consult heat press user manual for instruction).
- Record the heat press parameters, and verify periodically that the heat press is operating to the recorded parameters.
The SureColor F-Series Dye-sublimation printers include imaging configurations for Epson DS Transfer papers. Color calibration is necessary to compensate for differences between printers, heat press equipment, workflow and environmental conditions.

Color calibration using Wasatch SoftRIP typically takes less than 10 minutes to complete. Recalibrating the system should be done periodically and when any notable changes to the workflow occur.
Section 1: Print the calibration target with the ICC Profile Disabled

Step 1: Open the Wasatch SoftRIP software

Step 2: Select the printer unit you would like calibrate, and then click on the icon.

Step 3: The printer unit setup window will appear. Select the Imaging Configuration appropriate for the user’s workflow, and then click the Edit button.
Step 4: In the Imaging configuration window, click on the **Color Transforms** button

Step 5: In the Color Transforms window, Below ICC Output Profile click on the **Select** button and choose **None**. Next, click on the **Calibration** button, and when the Calibration window appears, click Calibration Curves, then in the Calibration Curves windows, click **Clear All** to remove the curves. Lastly, Click the **OK** button two times to return to the Color Transforms Window.
Step 6: Click the **OK** button, and if you receive a warning message click **NO**. When the Save As window appears, add to the configuration name the text Temp, noICC, or some other indicator that the configuration is only for temporary use. Then click **OK**, and then **OK** in the Setup window.
Step 7: In the main window of Wasatch SoftRIP, Click 📀 to open a file. When the file browser window appears, navigate to the **psfiles** folder in the root of the Local Disk (C:), and select **eyeone.ps** and click the OK button. Lastly, click on the 🚨 button to RIP and Print.
Section 2: Sublimate and Measure the Calibration target

Step 1: With the printed transfer paper, sublimate the image to the textile product using the recommended heat-transfer parameters. *Note: Ensure that the heat press temperature has stabilized and is operating at the correct temperature.*

Step 2: Click on the icon to change the print unit setup, click on the **Edit** button in the Setup window, and then click on **Color Transforms** in the Imaging Configuration window.
Step 3: In the Color Transforms window, click the **Calibration** button, and then in the Calibration window, click **Calibration Curves** button.

Step 4: In the Calibration Curves window, click Densitometers from the top menu and select X-Rite i1Pro 2 from the list (or appropriate device if using a different spectrophotometer).
Step 5: In the Densitometer Setup Window, click on the **Configuration** button. Select the measure mode for the spectrophotometer that is best suited to the textile product (M2 for Fabrics, M1 for Rigid Photo products), and then click **OK**.

Step 6: Click the **Calibrate** button to calibrate the spectrophotometer to the reference sample (Consult the X-Rite i1Pro2 user guide for assistance using the spectrophotometer hardware), and once complete click the **Next** button.
Step 8: Prepare the sublimated textile material for measurement. With non-opaque textiles, such as fabrics, place several layers of the fabric behind the sublimated sample.

Step 9: Click the Read Strip Cyan button. Follow the instructions on the screen and measure the cyan strip on the sublimated textile. Repeat reading measurements for Magenta, Yellow, and Black. Once completed, click the Finish button.
Step 10: The updated calibration curves will be displayed in the window. Click OK to continue.

Step 11: Select the original ICC Output Profile in the Color Transforms window by clicking the Select button, and then locate the ICC file in the window and the Open button. Then click OK.
Step 12: Save the recalibrated imaging configuration and rename with a meaningful name, and then click OK.

At this point the imaging configuration has been updated to compensate for differences between the user’s environment and the factory’s environment where the initial configuration was created.
Spot Color Matching

Produce target colors quickly with good accuracy using a wide range of easy-to-use features in Wasatch SoftRIP.

Wasatch Tools available:
• Spot Color Capture tool and Color Neighborhood tool for matching physical samples
• Color Database tool for matching design palettes
• Color Atlas tool for creating a swatch sample book
Spot Color Capture

Spot Color Capture allows you to record any spot color from a swatch book or other color sample simply by clicking on it with a handheld spectrophotometer. Once the color is read, the CIE Lab values are entered automatically, and can easily be added to the Color Database for future use.
The Color Neighborhood tool will print 100 nearby color patches that surround a specified color. The specific color can be captured with a spectrophotometer using the spot color capture tool, or a color value can be entered.

Once the color chart has been printed and sublimated, compare the patches to the physical sample to find the closest result. The values printed below the patch are to be used as the spot color replacement value.
The Color Database feature enables you to maintain a list of saved and frequently used colors. Having a list of named colors makes it easy to create a spot color replacement.

Please note that Wasatch SoftRIP 7.3 has improved the functionality of the color database tools making it easier to locate specific colors.
With the Color Atlas Generator you can quickly create a custom swatch book and match colors accurately. Simply specify and print a range of color swatches on your target fabric, then pick your desired swatch and enter its RGB value into SoftRIP or save it in your Wasatch Color Database.

A Color Atlas swatch book is an excellent selling tool to demonstrate the range of colors that can be achieved.
The SureColor F-Series printers aim to deliver accurate color, however some users may forego accuracy for “enhanced color”.

Color Enhancements within Wasatch SoftRIP
1. Boosting Color Saturation with Input Profiles
2. Making adjustments using Correction Curves
A simple approach to increase the overall color saturation of an image is to change the input color profile to one with an increased saturation level. This will boost the saturation level while respecting the established printer ink limits for reliable and consistent results.

Steps:
1. Open Imaging Configuration and select Color Transforms
2. Click the Select button in the ICC Input Profiles section and choose Browse to Change default Input ICC Profile to the +10%, +20%, or +30% Saturation profile
3. Uncheck “Use Embedded ICC Profile”
4. Save the updated imaging configuration with a meaningful name
The Correction Curves feature in Wasatch allow for fine control over total color curves as well as independent color channels.

There are a number of enhancement curves preloaded that can be used to boost contrast, enhance highlight and shadow details, and lighten or darken the image.

In addition, the color curves can be manually adjusted to warm or cool an image, clip off-white colors to white, and many other effects.
<table>
<thead>
<tr>
<th>Correction Curve Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter Curve</td>
<td>Manual Entry by typing input/output values of the curve</td>
</tr>
<tr>
<td>Linear</td>
<td>1:1 Input to Output curve (Default)</td>
</tr>
<tr>
<td>Punch Contrast</td>
<td>Boost Image Contrast</td>
</tr>
<tr>
<td>Punch Highlights</td>
<td>Brightens Highlight tones</td>
</tr>
<tr>
<td>Negative</td>
<td>Shape of existing curve is flipped so that min/max are swapped. Not typically used.</td>
</tr>
<tr>
<td>Invert Curve</td>
<td>Curve shape is mirrored over 1:1 curve. Light adjustments become dark and vice-versa</td>
</tr>
<tr>
<td>Convert to Neg. Lin</td>
<td>Similar to Invert Curve, but changes in highlights are applied to the shadows and vice-versa</td>
</tr>
<tr>
<td>Overall Enhance</td>
<td>Enhance the image with richer tones shifting colors darker</td>
</tr>
<tr>
<td>Dot Gain [Level]</td>
<td>Darken Shadows and lower-mid tones [Amount: Low, Med, High]</td>
</tr>
<tr>
<td>Plus 10%</td>
<td>Darken Mid tones for richer color</td>
</tr>
<tr>
<td>Minus 10%</td>
<td>Lighten Mid tones for brighter color</td>
</tr>
</tbody>
</table>
Printer Simulation

The SureColor F-Series printers can be setup to simulate the color output of different printers by creating a model of the target print system.

This process will simulate many of target print system color capabilities on the SureColor F-Series printer, however there may be some colors that are difficult to simulated. In this case, consider using the spot color replacement tools to achieve a closer color match.
Steps:
1. Using X-Rite i1Profiler – Select either RGB or CMYK Printer based on the file types that the customer uses. If the customer uses both, two profiles will need to be created.
2. Generate an ICC pattern with between 800-1600 patches and print on printer to be simulated using the same settings that are used to produce regular print jobs.
3. Measure patches in i1Profiler and generate an ICC profile with Contrast and Saturation set to 0, and Neutralized Gray set to 50.
4. In Wasatch, open the imaging configuration and set the input profile to the newly created profile. Set the rendering intent to Relative Colorimetric, and uncheck the Use Embedded ICC option.
5. Save the updated imaging configuration with a meaningful name.
Profiling Recommendations

Creating an ICC profile tailored for a specific workflow (printer, transfer paper, heat press, and environment) can produce optimized results for a desired effect, such as improved color accuracy, more vibrant colors, or reduced ink consumption.

The following recommendations are provided to help simplify the profile creation process, reducing the guesswork, materials used, and amount of time required to produce excellent results.
Profile Recommendations (cont’d)

At the printer:
- Load printer with desired paper to profile
- Review and/or update media settings

At the Computer with Wasatch SoftRIP:
- Select an imaging configuration of none, and then click edit to start
- Set the individual ink limits to the values listed (page 35), but leave total ink limit at 400%
- Print the eyeone.ps target and perform color correction (see page 11 for step by step instructions)
- Save the imaging configuration with a meaningful name
Profile Recommendations (cont’d)

At the computer with X-Rite i1Profiler:
- In the Printer section, select **CMYK Printer** and then click **Profiling** from the menu
- Set the number of patches between 1-2,000 (1,200 recommended)
- Set the Total Ink coverage to the value in the total ink limit shown in the table (i1Profiler Total Ink Coverage value)
- Click Next and save the profile targets
- Print the profile target in Wasatch SoftRIP
- Sublimate the target onto the textile material
- Calibrate the spectrophotometer
- Measure the patches on the printed textile

Note: It is recommended to save the data on each page of i1Profiler so that changes to profile parameters can be made without the need to re-measure the printed pattern.
Profile Recommendations
(cont’d)

After measuring the pattern is finished:
- Set the device calibration standard to the appropriate setting for the textile (M2 for Fabrics or M1 for Rigid Photo), and click **Next**
- In the Default Lighting section, Set the CIE Illuminant target lighting conditions (Typically D50 or D65) and click **Next**
- Change the Profile Settings as follows:
  - Set the Total Ink coverage to the value in the i1Profiler total ink coverage limit value in the previous table. Note that using a lower value for the Ink coverage will increase the rate the black is substituted for CMY resulting in lower ink consumption
  - Use intelligent black: **Checked for Fabric** applications, **Unchecked for Rigid** Photo
  - Black start: **5 for Fabric** applications, **50 for Rigid** Photo
  - Black curve: **Med+** for all-around use, **Heavy to Max** for greater ink reduction
  - Perceptual: Select **Custom** (Contrast = 0, Saturation = 0, Neutralize Gray = 50)
- Click **Next**, Enter a descriptive name for the new profile, select where to save the profile, and then click **Create and Save profile**
Profile Recommendations (cont’d)

After ICC Profile has been generated:

- In Wasatch, edit the imaging configuration
- Select **Color Transforms**
- Click on **Select** under the ICC Output Profile section
- Located the newly created ICC Profile, and click **Open**
- Click **OK**, and then save the name of the imaging configuration with a meaningful name
<table>
<thead>
<tr>
<th>Paper Type</th>
<th>Print Mode</th>
<th>Drop Size</th>
<th>Black</th>
<th>Cyan</th>
<th>Magenta</th>
<th>Yellow</th>
<th>Total Ink Coverage Value for i1Profiler</th>
<th>Max. Media Total Ink</th>
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<tbody>
<tr>
<td>DS Production Paper</td>
<td>360x720 Fabric</td>
<td>Variable</td>
<td>90</td>
<td>85</td>
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