Epson's Guide to Optimize Print Quality with the Epson SureColor S30670- Best Practices

Introduction

The SureColor S30670 has been designed to meet the requirements of the indoor and outdoor signage market. Typical applications for the signage market include everything from billboards, soft signage and high end point of sale materials such as backlit displays and high quality vehicle wraps.

For that requirement Epson has designed a range of print quality modes to address each of those applications, from basic outdoor signage to high quality indoor signage.

The aim of this guide is to assist you with achieving the very best results when using the SureColor S30670 by combining the most appropriate print modes and the best setup practices, to achieve the right results, **for the chosen application.**

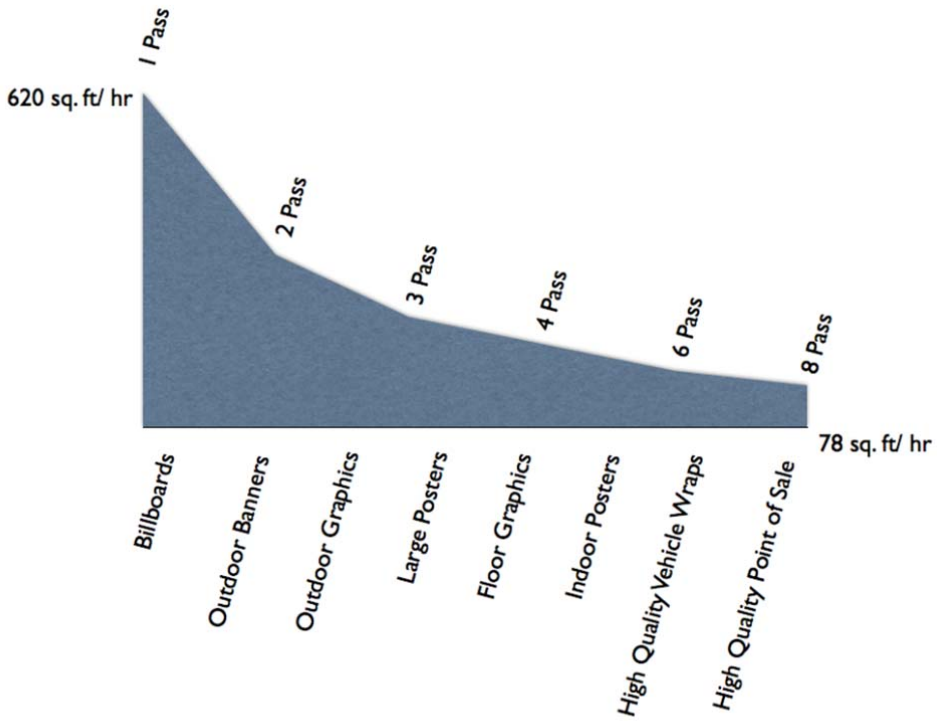
What Are the Available Print Modes?

Print Modes	Print Resolutions	Speed
1 Pass	360 x 720 dpi	~620 sq. ft.
2 Pass	720 x 720 dpi	~310 sq. ft.
4 Pass	720 x 720 dpi	~150 sq. ft.
6 Pass	1440 x 720 dpi	~105 sq. ft.
8 Pass	1440 x 720 dpi	~77 sq. ft.

When should I use them?

Print Modes	Viewing Distance	Application
1 Pass	20- 50 feet +	Billboards, outdoor banners.
2 Pass	20- 50 feet +	Billboards, outdoor banners.
4 Pass	10 – 20 feet	Outdoor posters, outdoor graphics.
6 Pass	5 – 10 feet	Large format posters, displays, floor graphics.
8-Pass	0 - 6 feet	HQ Vehicle Wraps, Backlit displays, Small decals.

What's the Best Print Mode for My Customer?



What Can I Expect With These Print Modes?

The Epson SureColor S30670 has been designed to offer the highest quality at 8 pass mode and therefore you can use this print mode with the expectation of high quality results such as smooth gradients, uniform solid colors and sharp halftones.

When printing at 1 pass mode, offering 620 ft^2 per hr., 2 pass mode or even certain media at 4 pass mode, it may be possible to see banding between each pass of the print head.

When printing 4 pass and 6 pass modes, a gradual improvement will be observed. There is likely to be unevenness in tone on very close inspection, the extent of which will depend on the actual image itself. For example large expanses of solid color will show more imperfections then a busy halftone image.

Choice of substrate, setup of the printer, quality of the color profile, setup of the RIP software will all DIRECTLY impact quality in any mode.

The illustration below is intended as a guide to ***possible*** results.

During our development we have found that many scrim vinyl products (banner type materials) are best used at 1-pass to 6-pass modes. For smooth calendared vinyl products or cast vinyl media (for example, Avery MPI 1005 SuperCast and 3m ControlTac 180-10), we have found that 6-pass to 8-pass will provide the best quality output. **This is only a recommendation as it is best for you to test this yourself and judge the acceptable quality that you require for your customer.**

What can I do to further optimize my SureColor S30670?

The SureColor S30670 User Guide offers a great deal of useful tips and techniques for setting up the printer. However, there are some settings that will have an immediate effect on overall print quality outlined below.

How to Setup a Custom Media Type?

The following recommendations to improve print quality all rely on setting up a custom media type for the specific media that you are using. This is STRONGLY recommended as it will maintain your media settings so you don't constantly have to adjust them. The SureColor S-series printers will prompt you EVERY TIME you load to select the type of media selected which will make this process much easier to remember. To customize the media settings, go to **Media Setup>Customize Settings>Media X** where "Media X" is a blank number or name not yet used. A short overview of the process is:

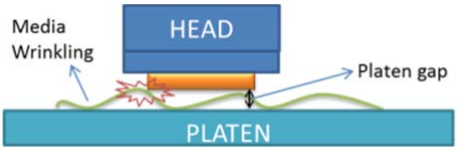
1. Give the media a name (this way you can easily identify this media on the control panel)
2. Set up the platen gap (explained below)
3. Set the temperatures (explained below)
4. Adjust the media tension settings (explained below)

5. Perform automatic media feed adjustments or manual, whichever works best with your media. **If the media tension is changed at any time, auto feed adjustment must be redone** (explained below)
6. Perform automatic print head alignments (explained below)
7. Be sure the custom media you created above is selected as the current media

When using custom media settings, be sure your RIP is NOT set to overwrite these values. This process is different for each RIP, so if you are confused or do not know how to do this, check with your RIP manufacturer. The full instructions are located in the User Guide on page 31-36.

Setting the Best Print Head Gap or Platen Gap.

The first step in improving print quality on any Epson SureColor printer is to set the best platen gap parameter for the specific media you are using. There are two considerations to make at this stage, quality and reliability. The closer a print head is to the substrate surface the better the overall quality. If the substrate gets too close to the print heads because of media buckling (caused by reaction to heat or moisture) it can result in head strikes. Head strikes are not always as dramatic as they sound. If you observe 'flecks' of ink across the printout (illustrated in the image below), it may be due to incorrect Platen Gap setting.



To resolve head strikes across the substrate surface, first increase the platen gap setting in the Custom Media menu of the printer control panel.

Thickness (mm)	Gap	Type
0.1 > 0.3	1.5	Vinyl, Polyester
0.31 > 0.75	2.5	Banner, Canvas
0.76 > 1.0	2.5	Others

Setting the Best Media Heater Temperatures.

Setting the heat correctly for each media will have a large impact on the amount of banding. Many media manufacturers include the recommended heater settings with their media or post this information online. If these settings are not readily available here is a strategy to set the heater temperatures. The overall objective is to set the heaters as LOW as possible while still assuring that the print is dry when it emerges from the printer and when sitting on the after heater. Obviously, the speed at which you print will have some impact so be sure to set the heater settings in the fastest mode you plan to print at on a particular media. A good recommended starting point is 40 (pre), 40 (platen), and 50 (post). It is highly recommended that you keep the pre heater and the platen heater at about the same settings as this will reduce the possibility of the media buckling and causing head strikes.

From there, run sample prints and check for media buckling, banding, for drying, etc. and adjust the media temperature as necessary. As well, ink load and the amount of ink used will have an impact so be sure your test image includes solid colors and light and dark areas and the print has a valid profile designed for the media you are printing on and be sure that profile has been linearized.

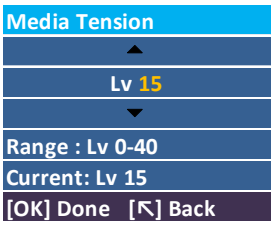
Setting The Best 'Media Tension'.

Depending on the substrate loaded in the printer, you can adjust the media tension applied. You can also set the frequency of tension measurement to ensure the SureColor S30670 always keeps a consistent tension on the substrate.

Media Type	Tension
Slick Media (eg Epson GS Canvas)	1-4
Scrim Banner	5-10
Polyester, Vinyl	12-20
Thin Film	25-25

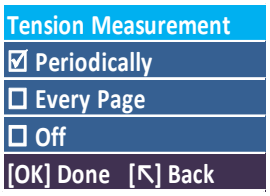
You can choose from 0 (no tension) to 40 (high tension). If you are unsure of the best tension setting, follow this generic rule.

- Thin media = **high tension**
- Medium media = **medium tension**
- Thick and/or heavy media = **low tension**



If the media tension is changed at anytime, auto feed adjustment must be redone

'Tension Measurement' set to 'Periodically' is recommended and will be performed every 15 feet. The measurement will be evaluated against the 'Media Tension' setting. If the Tension Measurement is turned to 'Off', the substrate system will roll more media than needed to avoid tension. This will compensate for the roll weight change while printing.



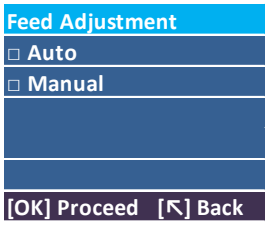
Automatic Adjustments for Media Feed.

Because all substrates feed through the printer with slightly different efficiencies it is highly recommended to perform substrate feed adjustment on <u>each media you use</u>.

Heavy, light or dark bands at regular intervals are known as white banding or dark banding and are a common result of poorly configured paper feed settings.

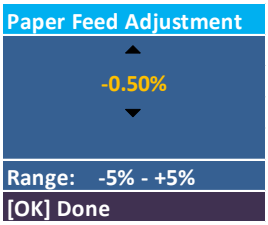
It is possible to perform these adjustments while the printer is in operation to correct many issues while in production.

To perform paper feed adjustments use the menu on the printer and navigate to the following location: **Media Setup>Customize Settings>Media X,>Paper Feed Adjustment.** If a RIP is being used, these settings *can* be adjusted through the RIP software interface however it is recommended that you use the control panel for the best results.



While the automatic method to complete the media feed adjustments is the easiest and quickest, if this process does not complete due to the type of media you are using or the results are not to your expectations, it is best to do a media feed adjustment MANUALLY. This will require printing 1 pattern ("Primary 500 mm" or "Primary 20 inch") from the printer control panel and then measuring this pattern manually. See your documentation for more information on this process.

With many media alignments, you should only need to do this process ONE TIME unless you see print quality issues in the future or change the platen gap or other media settings.



Even though you complete a one-time automatic or manual media feed adjustment it is sometimes necessary to do a media feed adjustment on the fly (while printing) during large print jobs. **This is especially true when printing in 1 pass or 2 pass modes.** To do this, while the printer is printing, press the media feed button and then use the up and down arrows to adjust the media. Increase the number if there are dark gaps and decrease the number if there are white gaps. The percentage adjustment should not be large. If you plan to do many prints at this "adjusted" speed, you can put this adjustment value into the RIP software and save the print mode so you don't need to remember to set the media with this setting. When done with the print job, be sure to then reset this setting on the control panel to 0.0%.

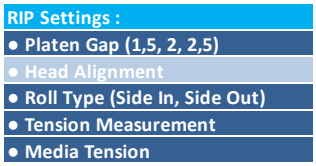
Automatic Print Head Alignments.

Print head alignments will have a large impact on grain and banding.

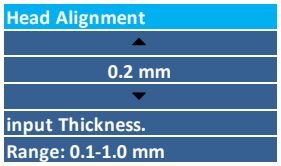
Before Head Alignments

After Head Alignments

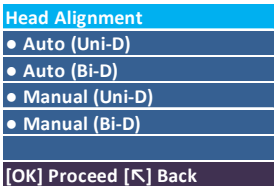
To perform head alignments, using the printer control panel, select **Media Setup>Customize Settings>Media X>Head Alignment**



Use the Printer control panel to access the media setup menu.



Input the correct media thickness for your substrate.



For the simple operation, choose 'Automatic' for either the Bi-D or Uni-D mode.

It is recommended that you do BOTH a Uni-D and a Bi-D alignment (Uni-D first *then* Bi-D). If the automatic methods do not complete due to the media surface, it is recommended that you do the alignments manually. As with many media alignments, you should only need to do the automatic adjustments ONE TIME unless you see print quality issues in the future or change the platen gap or other media settings. When doing print head alignments manually, if the least amount of banding is at an extreme (7 or 1) you should repeat the alignment until the least amount of banding is in the 2-5 range.

ICC Profiles and RIP settings

The ICC profile and environment that you use will have a large impact on the quality of the print. It is always recommended to use a profile created for the specific media that you are using. The best scenario is to create a custom profile for the media you are using on the exact printer that you are using. This will "fingerprint" that specific media to that specific printer. We realize that this may not always be possible so if you cannot create a custom profile for your specific printer, we recommend that you download or select a profile of the specific media you are using and Linearize that profile (called "recalibrate" in the onyx RIP). This should get acceptable results.

It's also important to be sure that you have selected the correct MicroWeave for your application. The Onyx RIP has 2-3 options per print mode to choose from. Selecting the correct MicroWeave pattern can reduce the visible issues in the print. Refer to the chart below:

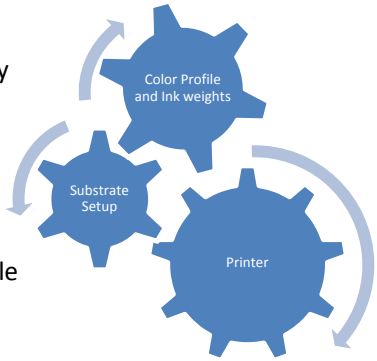
# of Passes (mode)	Resolution	MicroWeave Level	Best to help reduce
4	720 x 720	2	Light or Dark Lines Banding
4	720 x 720	3	Wide Bands/Color Uniformity
6	720 x 1440	0	Light or Dark Lines Banding
6	720 x 1440	1	Wide Bands/Color Uniformity
6	720 x 1440	2	Light or Dark Lines Banding
8	720 x 1440	3	Light or Dark Lines Banding
8	720 x 1440	4	Wide Bands/Color Uniformity
8	720 x 1440	5	Light or Dark Lines Banding

In addition to the MicroWeave settings, we have found the best results to reduce the amount of visible banding when customers use the AccuPhoto GS2 screening technology. Many profiles were included with the Onyx RIP that use this technology and it is indicated in the profile name ("AccuPhoto GS2"). If you are making a custom profile, it is recommended that you use this screening technology if it is available for the mode you want to use.

"I've done that, but I'm still not happy with the results. What else can I do?"

It's important to realize that there are 3 critical elements involved in producing a high quality print. The printer itself, the substrate setup and the quality of color profiles being used.

Quick Tips



- Consider investing in the color management process -- either by bringing in an expert or by investing in the required equipment (i1, Isis, etc) and software. Many print shops consider color management a wise long term investment for their business. It reduces wasted prints, ensures accurate repeat work and gives predictable results across all output devices. As well, calibrating a profile will reduce image quality issues considerable and is considered REQUIRED for optimum results.

- If your prints look over-inked or under saturated, this is a strong sign that improvement to the color profiles or profile calibration is required.

- Be sure to linearize the profile. In the included Onyx rip, this is done by pressing the "recalibrate" button on the tool bar. Different products have different print characteristics. By linearizing the profile you are bringing every printer to a common standard. You will need a spectrophotometer or other measuring device (like a i1, Isis or other device).

Maintenance

Always perform the required printer maintenance as outlined in the User Guide. This will ensure your print head is kept in optimum condition while printing and protect the overall life of the product. Failure to complete this maintenance will result in reduced print quality. When performing the maintenance, consult the User Guide for the best practices, they will save you time and ensure best possible results. Always use the recommended cleaning materials

T699300	SC-S30670 Ink Cleaner. (Cleaning liquid for print head maintenance)
C13T724000	SC-S30670 Waste Ink Bottle (For replacing collected waste ink)
C13T724100	SC-S30670 Maintenance Kit. (Wiper cloth, cleaning stick, protective gloves)

Thank you for your commitment to Epson. We wish you continued success with the Epson SureColor S-Series indoor and outdoor signage printers.

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