

StudioRIP service bulletin

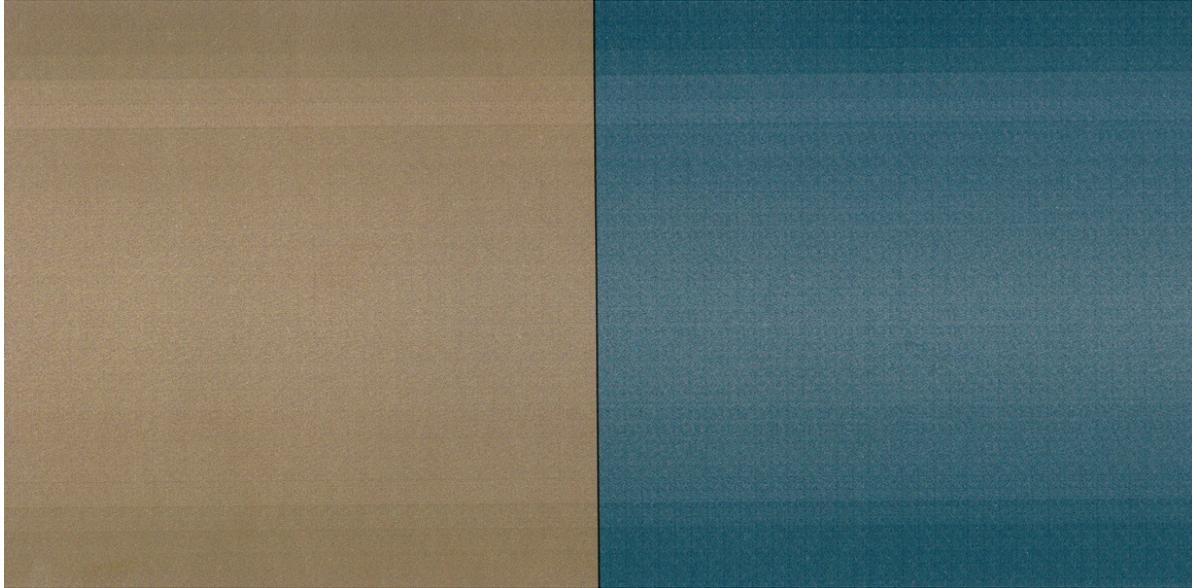
Proofing and color printing on Epson inkjet printers
2nd November, 2016

General description of the problem

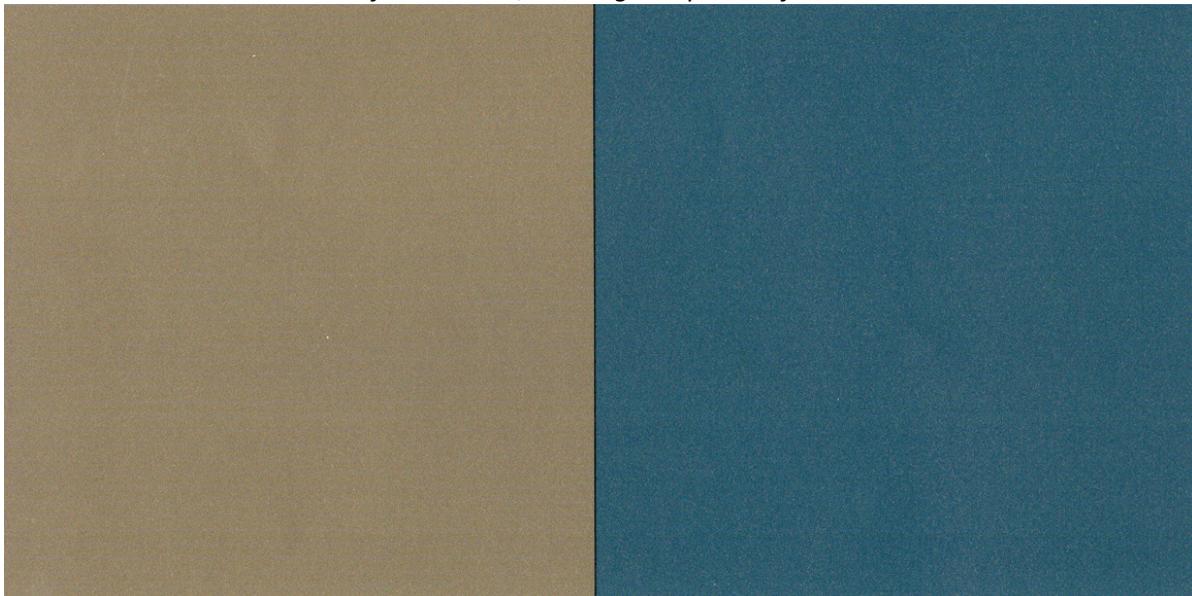
While StudioRIP proofs were generally smooth, banding and pattern free, customers often complained about banding and patterning issues on certain colors (mentioning that the Windows driver prints banding free, smooth results). Prints were even worse on the models with no light inks (such as SureColor T series).

Collecting and testing such jobs revealed that indeed there were problems with the proofing system of StudioRIP, as shown in the pictures below:

*Before: banding and patterns visible**



*After: smooth, banding and pattern free**



**note that the scans are intentionally increased brightness to highlight the errors, the actual prints were darker with less visible defects*

Simple steps to achieve banding and pattern free results

1. Download build 72 or newer of StudioRIP from <ftp://beta@ftp.studiorip.com>.
2. If you have the opportunity, redo the entire profiling process in the following way:
 - Download the native Epson T5200 job style from <ftp://dtf@ftp.studiorip.com> > SureColor T series > Epson T5200 @ 1440.jobstyle, and import it;
 - If you have different paper size, modify it;
 - If you have different printer type (e.g. SP4900), modify the printer name and the ink set (in the case of a 4900, 'CMYKcmkl');

As an alternative, you also can keep your original job style, go to the *Engine setup* task, *Edit values*, and do the following settings:

- Media type: Premium Semigloss Photo Paper (250)
 - Platen gap: Minimum
 - Roll tension: Normal
 - Paper feed adjustment: Absolute value, 0.28%
 - Paper suction: High (you may go down to Normal if you find it too noisy)
 - MicroWeaving: RIP based
 - Quality: Highest speed
 - Microweave fading: 25%
3. Do a feed adjustment in the following way:
 - Download *Ruler.pdf* from <ftp://dtf@ftp.studiorip.com>
 - Print it in portrait (that is, vertical) position using the job style obtained above
 - Measure it with a very accurate (possibly metal) ruler
 - In the job style obtained above, go to *Engine setup* > *Edit values* > *Adjust*, and enter the nominal printed length (e.g. 330 mm) to the *Printed length* field, and the physically measured length (e.g. 329.3 mm) into the *Measured length* field. Then save the new computed adjustment value by pressing OK.
 - Reprint the *Ruler.pdf* job using the job style with the new feed adjustment value. If the size still isn't perfect, do a fine tuning (entering the measured value again). If the size didn't change at all, it may be a printer firmware problem.
 4. Do a profiling from scratch using the job style above, paying attention to the following:
 - Double check that the nozzle check is perfect before starting the profiling.
 - On 5-color printers (such as the SureColor T series) it makes very little sense to make 720 dpi profiles (as the speed gain for banding free modes is little or none, while the quality is significantly worse). On these printers 1440 dpi is very quick anyway, so use 1440 dpi profiling.
 5. For better results, you may temporarily increase the print quality by:
 - Setting the *Top* and *Bottom* values of the *Unused area* to 25 mm in the *Positioning task* of the job style (this will ensure that the slightly different colors in the first and last inch of the page won't

mess up the profiling process). In case paper consumption isn't your main concern, you may leave it like this for the future;

- In the *Engine setup > Edit values > Interlacing settings > Quality enhancement* set *2x slower*, then revert it to *Maximum speed* after the profiling is done (this may feed the interpolation engine with more accurate values).

6. During the profiling, try to not change any settings you are not 100% sure about. Normally the only values you're supposed to change – apart from choosing the job style you want to profile – are the *Physical ink limit* in the *Proof linearization wizard*, and the Profiling accuracy in the *Contone proof wizard*. If you consider that any other settings need to be change, please discuss it with us first.

In case you don't have the opportunity to redo the entire profiling, you have very good chances to have the banding and patterning gone just by doing the first 3 steps above.

Finally:

- Let us know if you still deal with banding and/or patterning.
- In the future we intend to improve the low black generation proofing (using less black and having higher accuracy).
- Until then, you may encounter slight color accuracy issues around dark grays and black.

Technical details of the solution – for those who want to understand

When the StudioRIP proofing system was developed, it was tested on 180 nozzles/channel printers (such as Stylus Pro x800 and x880), on which the current system gave very good results. The problems started on the new printers with 380 nozzles/channel (such as Stylus Pro x900) which allowed larger media feeds between head passes and therefore banding became more likely.

We were able to achieve banding and pattern free results by identifying and finding solutions for the following problems:

- The stochastic cell used by the *Contone proof optimized (fast)* rasterization method was too small, causing patterns. Build 72 and newer use large stochastic cells with no patterning.
- The stochastic cell used for the interlacing (MicroWeaving) technique was also too small and possibly interfering with the rasterization cells, build 72 and newer use large and interference free cells.
- Although the high black generation offers better color stability and less ink consumption, it also increases the likelihood of banding and patterning. Therefore build 72 and newer will always suggest the use of low black generation.
- In variable droplet size (VSD) modes (typically 720 dpi mode) StudioRIP reached a 100% grid with the small (3.5 pl) droplet at around 60% tints, which was a minefield for banding. A new parameter is now added to the *Proof color management* task called *Maximum small droplet coverage (VSD only)*, defaulted to 70 on newly created job styles (but kept on 100 to maintain backward compatibility with already created proof job styles). This will avoid regular patterns that are prone to produce banding.
- In critical cases (such as no light inks, high black generation) proper mechanical settings of the printer are very important. High paper suction and properly set up feed adjustment can significantly reduce banding. We strongly recommend the use of the right parameters and a feed adjustment before doing any profiling – this will also increase the accuracy of the proofing.
- Our tests show that, at least with our current knowledge, the use of the 720 dpi mode on the SureColor T series makes little sense. As the 720×720 dpi printing mode has to use VSD to achieve the right density, and using VSD reduces the native horizontal resolution of the head from 720 to 360 dpi, the speed gain is limited to 2× (rather than to the expected 4×) compared to the 1440×1440 dpi mode. However, as banding is more difficult to suppress on 720×720 dpi, further quality adjustments are necessary in order to achieve banding free results, leading to very little or no speed gain at all – while the quality is significantly worse.
- This rule does not apply on the 8-10 color Epson printers (Stylus Pro x900, SureColor P series etc.). Although on these the speed gain is limited to 2× in a similar way as on the SureColor T series, the use of the light inks and the smaller feeds allow banding free output with speed optimized settings, so you can take advantage at least of that 2x higher speed.