

ONYX[®] White Paper

Banding Issues With Wide Format Printing

July 2011

Preface

In this white paper we will discuss the issue of banding with wide format printing. We will explore the various causes of banding and offer suggestions to attempt to resolve banding issues.

Banding

Banding issues, or commonly called pass banding, can be a significant problem in wide format printing. Banding is a striping effect usually seen across the width of the media, see *Figure 1* below. Identifying the cause of banding and resolving the issue can be a time consuming process because of the various reasons for banding.

These causes include:

1. Nozzles out or clogged/head alignment is off
2. Dot gain banding
3. Media adjustment
4. Media skewing
5. Pre-heater set too high
6. Ink restrictions
7. Vertical banding

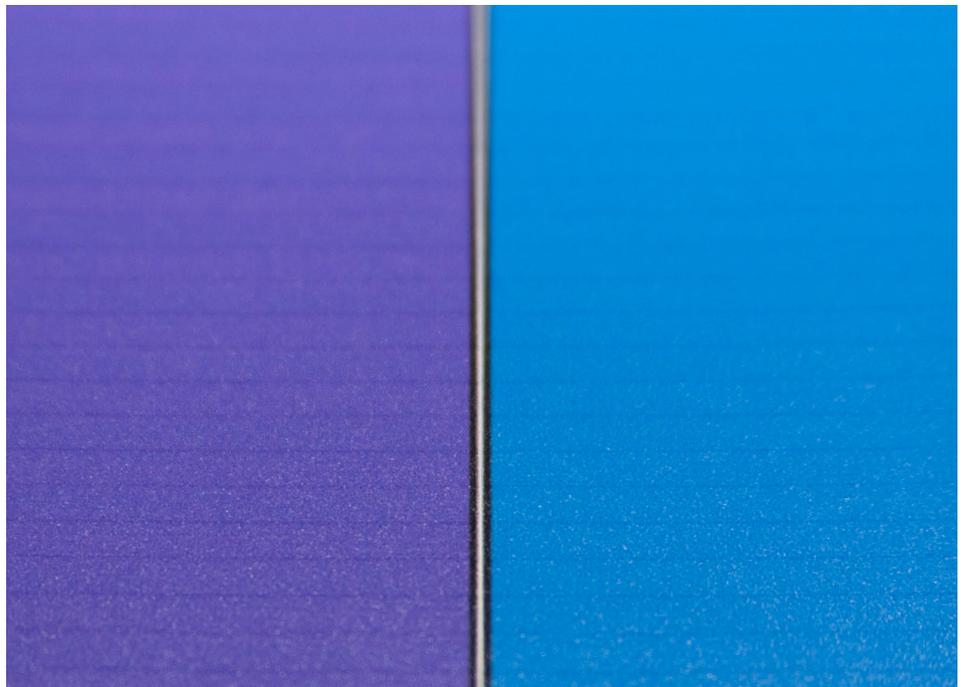


Figure 1 - Horizontal lines are banding across the image

Nozzles out or clogged/head alignment is off

Before trying to pinpoint causes of banding issues, eliminate the most obvious cause first. If you are missing nozzles, (confirmed by performing a nozzle check or nozzle test from your printer panel) or the printheads are out of alignment, you will likely see banding. Having nozzles out will appear as either a white line or a line of color that is incorrect (due to ink colors not mixing correctly). Nozzle tests should be completed daily (first thing in the morning) or after the printer has been sitting for a period of time. Head alignment should be verified often as well. All printers have test prints that aid in nozzle check and head alignment and can be performed from the printer panel. See your printer manual or contact your printer manufacture for additional instructions on nozzle checks and head alignment.

Dot gain banding

Dot gain banding occurs with solvent printers and is caused by the solvent not evaporating quickly enough, causing the pigment to “spread”. The leading edge of the current printing pass can bleed 1-3 mm causing an uneven, fuzzy edge that will bleed into the preceding pass causing the banding issue. The most common culprit are incorrect heater settings. Usually, the cause is from the “print” heater, which is the heater directly under the printheads, set to a temperature that is too low. This heater needs to be set high enough to evaporate the solvent but not so hot as to cause media buckling or nozzles to dry out.

Media adjustment

Media adjustment, also known as media correction, correction factor, feed compensation, and others, is the ability of the software and/or the printer to compensate the advancement of the media in a positive (forward) or negative (backward) way. Tiny, hairline white gaps between passes indicates the media is advancing or moving too far between passes. Tiny, hairline dark gaps that overlap indicate the media is not advancing or moving far enough. Many printers have a print test to determine if the media is advancing too far or not far enough. ONYX allows for software controlled compensation through the Mode Options within the media settings for many medias. This option is not available for every printer, but is typically found on printers that also have the adjustment ability on the printer panel. The ONYX setting can be found by going to Configure Printer, Media tab, Options or Mode Options.

Media adjustment should only be considered if the hairline banding goes all the way through the width of the print because the result is a tiny hairline gap through the entire width of the media. If the banding occurs in just one color check to ensure all your nozzles are firing. Media adjustment can be an ongoing adjustment since it can be affected by the weight of the roll (the roll will get lighter as it gets used), humidity (sticky media), and media weight or thickness. Some printers let you store compensation factors for different types of media.

Media skewing

If a roll of media is not loaded into the printer with even tension across the width, media skewing can occur. This typically shows up as a hairline underlap on one side of the media, and an overlap on the other indicating the media is not advancing evenly and uniformly through the pinch rollers. This is typically caused by incorrectly loading the roll of media. One method used for correct loading is to pull the media through the printer almost all the way to the floor, then “backroll” the media back to its start point before closing the pinch rollers. This allows for the media to correctly seat itself on the printer.

Another reason for skewing is due to curled media corners that are not flat. This can happen if media rolls are stored loosely or untaped, or the tape is removed before the media is put on the printer spindle. The important point to remember is that the media must advance evenly through the pinch rollers of the printer or banding may occur.

Pre-heater is set too high

If the pre-heater is set to high, the media will sit on the hot printer platen which can soften the media to the point that it becomes distorted in size. This means the media gets hit with ink while the media is soft, then changes in size when cooled. The change in size can cause banding that would not show up until the print is cooled.

Ink Restrictions

Part of the ONYX media profiling process is to set ink restrictions which are the first stem in limiting the ink that is laid down by the printer. If the ink restrictions are set too high, banding can occur due to excessive ink. This can be especially difficult to diagnose on UV printers, where the ink cures regardless of amount. Excessive ink banding on UV printers is also known as ink combing (it looks like someone combed the ink). It is a common mistake to set the initial ink restrictions too high in UV ink profiling. Remember, if you cannot see the difference between patches on the ink restrictions swatch, set the value to the lower amount to ensure you are cutting out waste ink. This results in using as little ink as possible which can save a substantial amount of money.

Vertical banding

Vertical banding can occur when the heaters are set too high. This causes the media to “ripple” between the pinch rollers. This causes a change of distance for the ink to travel (shorter travel distance for the ink to hit the media between the rollers), causing a change of ink density that causes vertical banding. By lowering the heater settings, you can eliminate the “ripple” effect vertical banding.

Please contact our ONYX Support Crew with any additional questions via phone or email at 800-295-8324 or support@onygfx.com. You can also create a Support Web Case or search our Knowledge Base at www.onygfx.com/support

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