6 Print Quality

Print Quality Troubleshooting Actions

NOTE: For some Print Quality problems, a Call Agent can try and troubleshoot the Printer by requesting the Customer to perform certain actions. Using this process, most problems can resolved without the need of an on-site visit.

When faced with a Print Quality problem, perform the following actions in order to resolve the problem:

1. Printer Configuration:
   - Make sure that the **paper type** selected in the Front Panel is the same as the paper type loaded into the Printer. To check this, use the View loaded paper key on the front panel. At the same time, check that the paper type has been calibrated. Also make sure that the paper type selected in your software is the same as the paper type loaded into the printer.
   - Check that the customer is using the most appropriate print-quality settings for his purposes. See “Select print quality” on User Guide. We will likely see lower print quality if we have moved the print-quality slider to the 'Fast' end of the scale, or set the custom quality level to Fast.

NOTE: If the customer has set the print quality with the printer driver or with the Embedded Web Server, that overrides a print-quality setting from the front panel.

NOTE: You cannot change the print quality of pages that the printer is already receiving or has already received (even if they have not started to print yet).

   - Dry time should be set to “Optimal”.
2. Perform Printhead recovery (**Ink Menu** > **Image Quality Maintenance** > **Clean Printheads**).
3. Make sure that HP or HP-approved media is being used.
4. Perform the Printhead Alignment (**Ink Menu** > **Image Quality Maintenance** > **Align Printheads**).
5. Check if the latest version of the firmware is installed. If not, install the latest firmware revision.

How to Use the Service Image Quality Diagnostic Print

What is the Service Image Quality Diagnostic Print?

1. The Printer contains an internal Image Quality Test which helps you to diagnose the possible source of any image quality defects. The Service Image Quality Diagnostic Print is available in the following options:
   - Service Image Quality Best Plot. This plot helps you to diagnose in more detail the possible source of any image quality defects. It is accessible through the Service Utility Menu.
   - The Service Image Quality Best Plot uses the Best Print Mode and is divided in to three parts as follows:

- Printhead Reliability Test. The purpose of this test is to identify which Printhead is faulty.
- Printhead Alignment Test. This test is designed to check any color-to-color and bi-directional misalignment the printer may have.
- Printheads and Paper Advance test. This test is designed to check whether the Printheads and the Paper Advance Mechanism are working correctly.

2. Service Image Quality Normal Plot. This plot is the same as the Service Image Quality Best Plot but uses the Normal Print Mode.
3. Others. These tests provide more information concerning the IQ defects that could found from the <emphasis italic>Service Image Quality Plots and comprise:

- Visual Alignment Diagnostics.
  Used to check pen alignment reliability.
- Visual Paper Advanced Diagnostic.
  Used to check advance reliability
- Plot for escalation only.
  Used to check more details of the Nozzle Health.
- Force Drop Detection.
  Used to reset the nozzle health historic data base and force new drop detection.
- Disable Paper Advance Sensor.
- This option allows the Paper Advance Sensor to be disabled and forces the advance control to use the analog encoder system. The Paper Advance sensor will operate again after the unit has been rebooted.

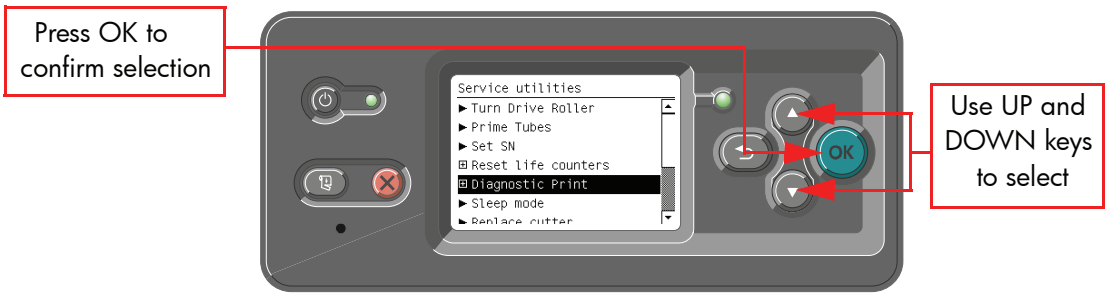
Considerations for Printing the Diagnostic Print

1. You must have paper loaded
2. Use the same type of paper that the customer was using when they found the image quality problem.
3. If the customer is using non-HP paper and after the Image Quality Test you still have the same image quality problems, change to genuine HP paper and repeat the Image Quality Test.
4. If you do not see any problems with the Image Quality Test, then the problem may not be with the printer itself. The problem may be with the RIP or the driver for example.

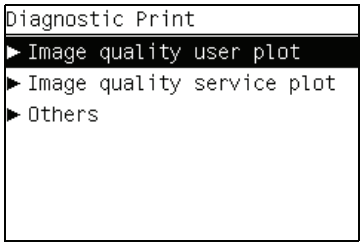
However, if you do see problems with the Image Quality Test then continue with the Advanced Diagnostic procedures which will help you to diagnose the problem.

Printing the Service Image Quality Diagnostic Print

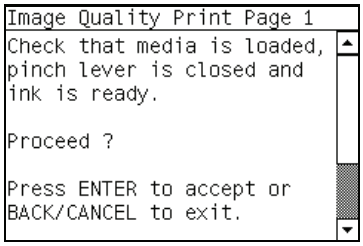
1. In the Service Utilities submenu, scroll to “Diagnostic Print” and press **Enter**.



2. You will be given an option to either print the “Service Image Quality Best” the “Service Image Quality Normal” or the “Others”. Use the Arrows keys to make the selection and press the **Enter** key to start printing the required Diagnostic Print.
If you selected the “Others”, use the Arrow keys to make the required selection: “Visual Alignment Diagnostics”, “Visual Paper Advanced Diagnostic”, or “Force Drop Detection”, and press the **Enter** key to start printing.



3. Make sure media is loaded, the Pinch Lever is lowered and that the Ink System is correctly installed. Press the **Enter** key to print the Diagnostic Print or press **Back**/**Cancel** to exit without printing the Diagnostic Print.



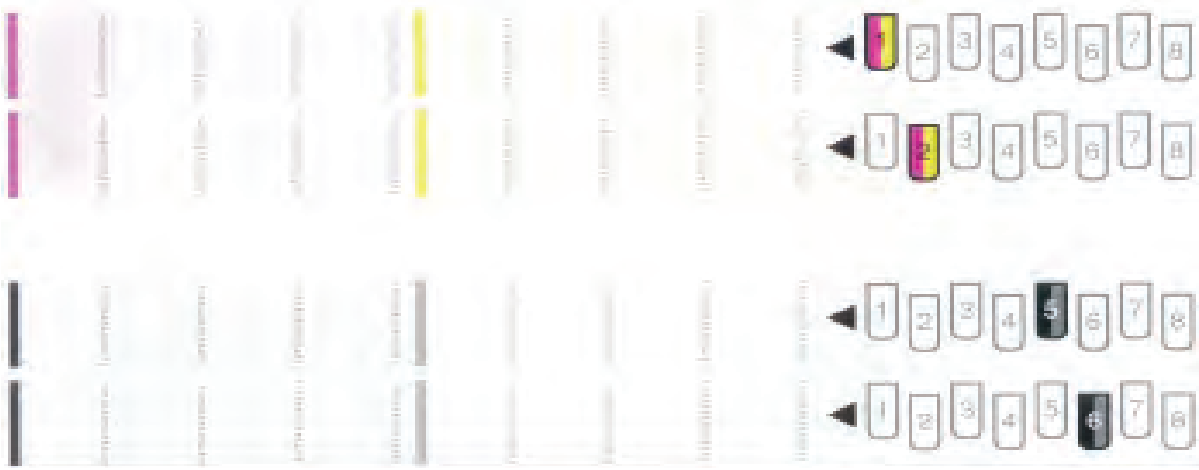
4. The selected Diagnostic Print will now be printed.

Diagnostic Part 1: Printhead Problems

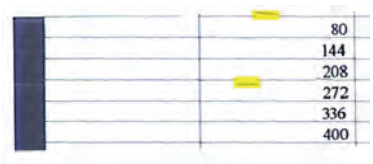
The Nozzle print test is designed to check if the Printhead nozzles print correctly.

The nozzles check (bottom of the plot) is printed in a one-pass full swath mode. The diagnostics test prints out every single nozzle of each Printhead without applying an error hiding or alignment algorithm.

For each Printhead, you can see both the adjacent and the consecutive nozzles. For every Printhead there is a different horizontal band that can be identified with the help of the template marked with the colors of the Printhead used at the right of every band.



There are a series of numbered stepped diagonal lines. If one or more of the nozzles are malfunctioning or mis-positioned, you will see that the stepped lines are broken or misdirected in one or more places.



This is an example of nozzles outs. You can see the broken or the skewed line, in this case marked in yellow to help you to understand the issue. In the service plot there are no yellow marks.

This is an example of nozzles mis-positioned or malfunctioning. You can see the broken or the skewed line, in this case marked in yellow to help you to understand the issue. In the service plot there are no yellow marks.

Corrective Action

If the printer has nozzle defects, it does not mean that you will not get perfect print quality results because the Printer can automatically compensate for this so there is no need to replace the Printhead.

The method of improving Nozzle Defects is to:

1. To clean the printheads, go to the printer's front panel and select the ink, then Image quality maintenance > Clean printheads. Then select which printheads you would like cleaned. You can clean all of the printheads or only some of them. Your choices are:

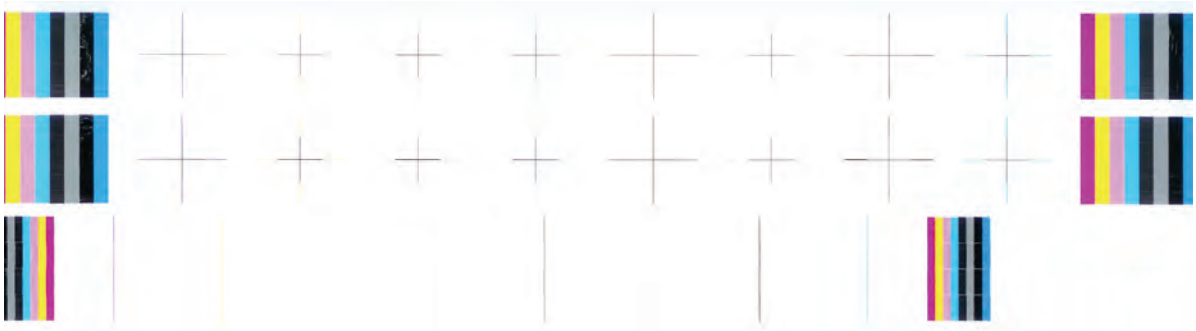
   - Clean all
   - Clean M-Y
   - Clean LM-LC
   - Clean PK-LG
   - Clean MK-C
   - Purge ink

   Cleaning all of the printheads takes about five minutes. Cleaning any two printheads takes about three minutes. Purging the ink takes about six minutes.

2. Reprint the Printhead Nozzles Test Plot to verify that the defective nozzles have been corrected.
3. If the problem continuous, replace the defective Printhead.

Diagnostic Part 2: Alignment Test

This test is designed to check any color-to-color and bi-directional misalignment the printer may have.



1. If the Printer is experiencing **horizontal** misalignment problems, the Alignment Test will show something like this:

2. If the Printer is experiencing **vertical** misalignment problems, the Alignment Test will show something like this:

3. If the Printer is experiencing **bi-directional** misalignment problems, the Alignment Test will show something like this:

Corrective Action

1. Perform a Printhead Alignment, using the same paper type with which you were experiencing unacceptable image quality, if feasible (some paper types are not suitable for Printhead Alignment).

Diagnostic Part 3: Printheads & Paper Advance Test

This test is designed to check whether the Printheads and the Paper Advance Mechanism are working correctly. This part of the Image Quality Test should **not** be used to check for color consistency or accuracy.

Banding

If the Printer is experiencing a banding problem, you will see repetitive horizontal bands within the printed image.

- Dark line banding repeated along the band (from top to bottom at the same distance).
- White line banding repeated along the band (from top to bottom at the same distance).

The plot is printed in Best or Normal mode (according to the menu option selected) with Error Hiding ON. The first top band has 100% ink density patches while the bottom band has 50% ink density.

Troubleshooting Banding Problems

If banding **does not** occur in ALL the colors, then it is more than likely a Printhead problem. In this case, try the following:

1. Check that the appropriate print quality settings are being used.
2. Recover the printheads using the option through the Front Panel (**Image quality maintenance** > **Clean printheads**). Reprint the Diagnostic Print or the print file and if the problem persists, replace the faulty Printhead.

If banding **does** occur in ALL the colors, then it is more than likely a Paper Advance problem:

- If the bands are light, it means that the paper has advanced too much.
- If the bands are dark, it means that the paper hasn't advanced enough.
- In high quality modes, graininess in ALL colors can indicate problems either with alignment or Paper Advance.

In order to solve any of these problems, try the following:

1. Check that the appropriate print quality settings are being used.
2. Check that the loaded paper is the same type as selected in the printer. Verify this through Front Panel the option (On the Front Panel, select the  icon, then **View loaded paper** > **View paper details**).
3. If the customer is using low quality paper, try recommending better quality paper (preferable HP paper). Printer performance can only be guaranteed by using recommended papers.
4. Check the advance with the help of the Visual Paper Advanced Diagnostic.

NOTE: If there is white point banding in only one color band and the problem cannot be fixed using the Printhead recoveries, in some cases using the force a drop detection option can fix this issue (see Others Diagnostics: Force Drop Detection).

No Printing Defects Found in the Diagnostic Print

If all the test patterns from the Diagnostic Print are correct and you still experience Image Quality problems, you can use the following procedures to resolve the problem.

- Visual Alignment Diagnostics.
- Visual Paper Advanced Diagnostic.
- Plot for escalation only
- Force Drop Detection.
- Disable Paper Advance Sensor.

Advanced Diagnostic: Visual Alignment Diagnostic Print

This plot helps you to visually check any alignment problems of the printer.

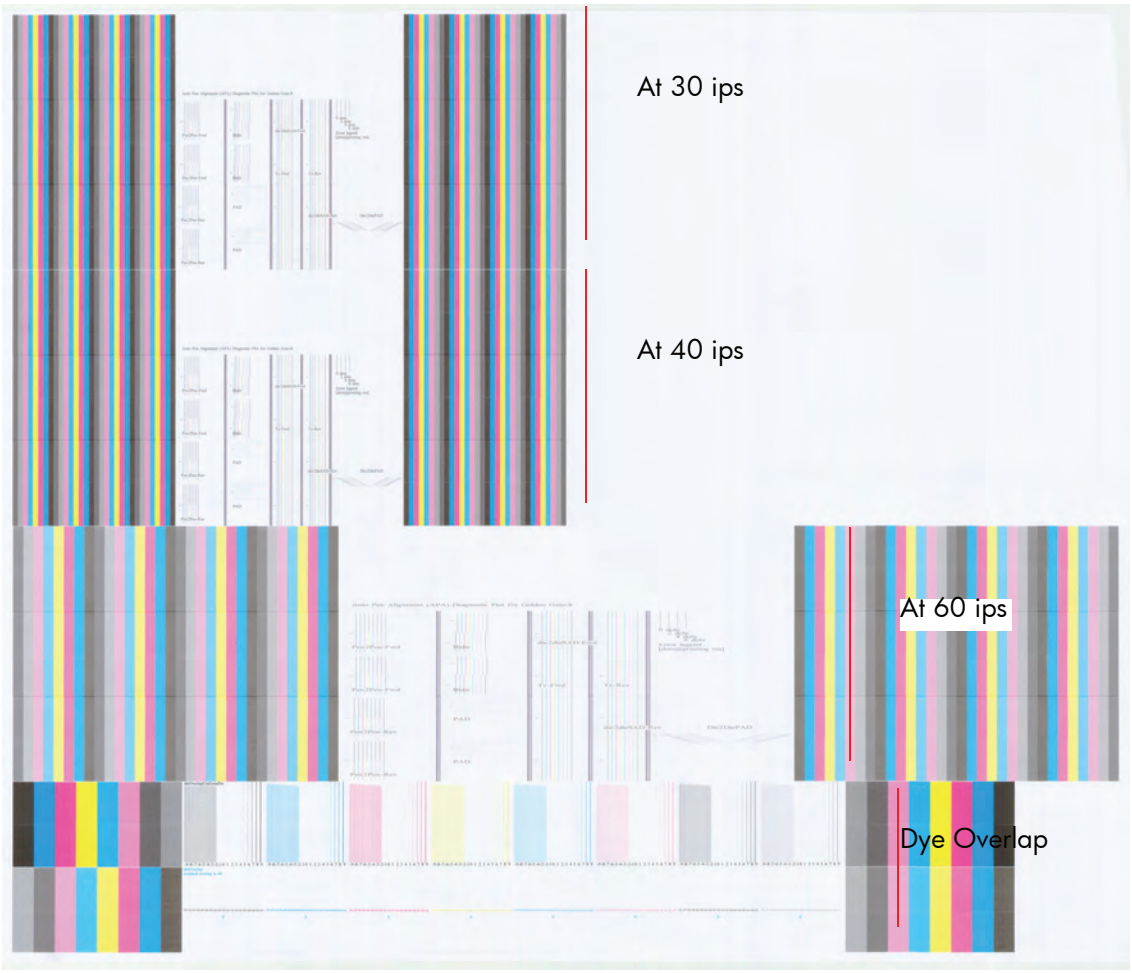
You use it to precisely measure the alignment error with one dot row accuracy.

The plot is split in four areas. The three first are the same plot printed at different speed: 30, 40 and 60 ips to check most of the pen alignment. To know the print modes associated to the speed see the next table:

PM by Paper Category		ips
Paper Type Category	**Quality Setting**	
Plain	Fast	60
	Normal-Fast	40
	Normal	30
	Best	40

Coated	Fast	30
	Normal-Fast	40
	Normal	
	Best	
Heavy and Super-heavy Weight Coated	Fast	40
	Normal-Fast	
	Normal	
	Best	
Other DFA	Fast	40
	Normal-Fast	
	Normal	
	Best	
Glossy	Fast	60
	Normal-Fast	
	Normal	
	Best	
	High Quality	40

The fourth part is to check the same color staggered pen overlap.



What to see in the Auto Pen Alignment Diagnostics:

1. At the left we have four checks for the pen to pen alignment in scan axis direction (Pen2Pen-Fwd or Pen2Pen-Rev). It is forward and reverse.
   a. The top pattern is related to the front printhead (nearest to the user when doing the pen replacement).
   b. The bottom pattern is related to the rear printhead (more far to the user when doing the pen replacement)

   The area to check is the junction (marked with a "-") of the black with the rest of colors.
2. The bidirectional check is at the top, marked as number 2 (Bidir)
   a. The top pattern is related to the front printhead (nearest to the user when doing the pen replacement).
   b. The bottom pattern is related to the rear printhead (more far to the user when doing the pen replacement)

   Check that the lines are continuous without a gap. The junction is marked with a "-"
3. The pen to pen alignment in paper advance direction (PAD) is marked as number 3.
   a. The top pattern is related to the front printhead (nearest to the user when doing the pen replacement).

b. The bottom pattern is related to the rear printhead (more far to the user when doing the pen replacement)

The area to check is the junction (marked with a "-") of the black with the rest of colors.

4. The alignment in scan axis direction between both printhead of the same color is marked as 4a (in forward direction die2dieSAD-Fwd) and 4b (in reverser direction die2dieSAD-Rev).

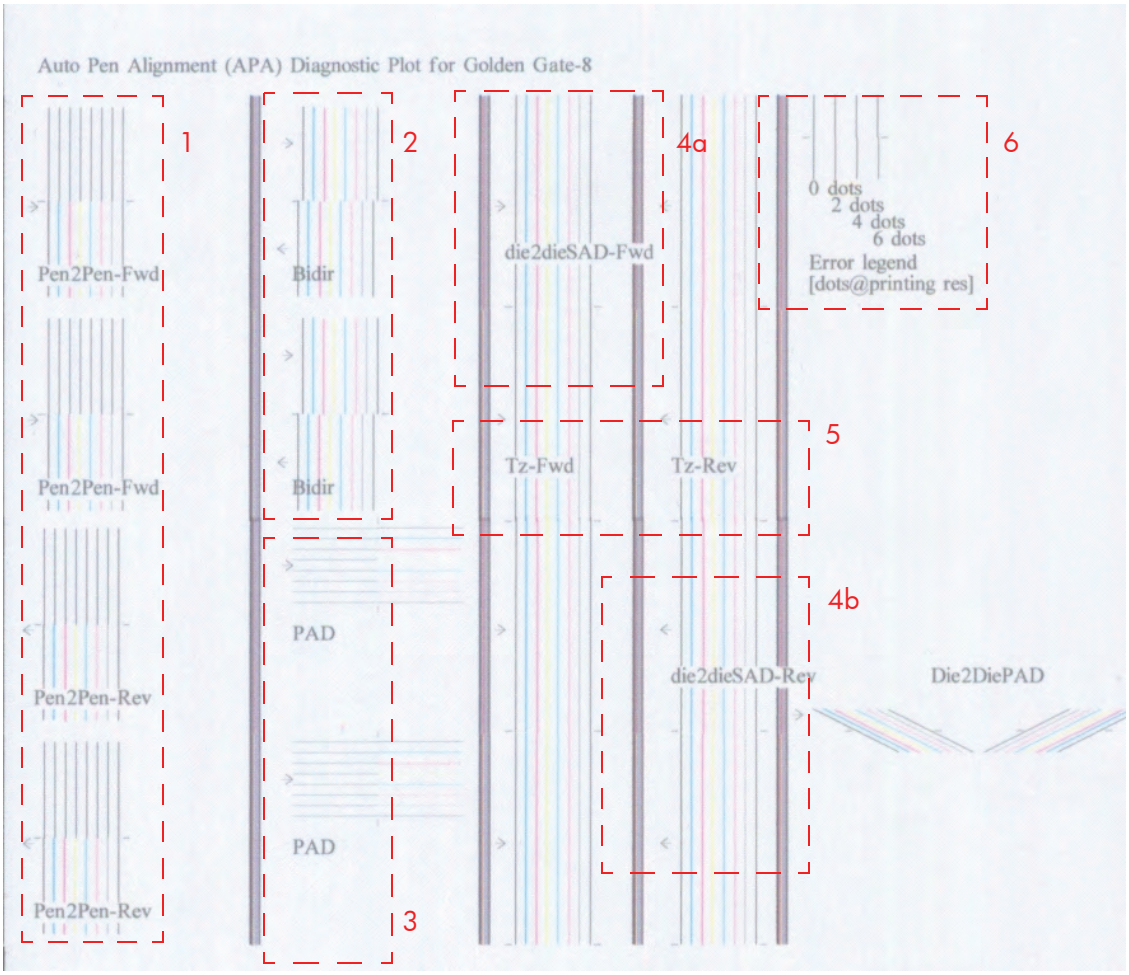
   The area to check is the junction (marked with a "-"). The lines have to be continuous.

5. The ThetaZ of the printhead are checked in the area marked as 5. It checks in forward (Tz-Fwd) and reverse direction (Tz-Rev).

   The area to check is the junction (marked with a "-"). The lines have to be continuous.

6. The area marked as number 6 is a reference legend that shows junction misalignments of 2, 4 and 6 dots. The junction to check has to be below 4 in all the cases. If the error we appreciate is above 4 dots, then realign the printheads again.

   In the next example, the Bidir is above this 4 dots and the unit should be realigned. The rest of the pattern shows a right alignment.



What to see in the Dye Overlap Alignment.

The area to check is only the bottom junction pattern for all the colors. The clearest band has to be around the 0 (±3 dots). Every band is equal to 1 dot error.

In order to solve any problem in the alignment, try the following:

- Repeat the printhead alignment. Most recommended papers are glossy papers were pen alignment accuracy is best. There are some paper types that are not suitable for Printhead Alignment (transparent, translucent, …)
- If the alignment process shows the message "Printhead alignment may use up to 3m of paper" in the front panel. it is because the OMAS is not working. It can be normal for a few types of papers that cannot be controlled by OMAS. How to check if your paper is OMAS or non-OMAS:

See in the **Service Menu** > **Diagnostic print** > **Others** > **Visual Paper Advance Diagnostic**

- If the issue cannot be fixed after repeat the printhead align, the try to clean the Printheads,

  To clean the printheads, go to the Front Panel and select the icon, then I**mage quality maintenance** > **Clean printheads**.
- If the issue cannot be fixed, then replace the printhead color that is failing in the align check pattern.
- If there is an issue in the ThetaZ and it cannot be fixed, check if the paper is working with OMAS. In that case, the issue could be a bad functionality of the OMAS subsystem. Go to the advance troubleshooting and apply the OMAS process.

Advance Diagnostic: Nozzle Health Diagnostic Print

There are two plots with three parts every plot. Both plots have the same pattern. The first printed plot refers to the rear printheads (number 1, 3, 5 & 7), while the second plot refer to the front printheads (2, 4, 6 & 8).

The top area is the Variable frequency nozzle health plot with odd/even nozzles separation. This part does not need to be looked at, it is only for escalation purposes.

REAR PRINTHEADS 1-3-5-7

FRONT PRINTHEADS 2-4-6-8

The second part is the bottom left. This part does not need to be looked at, it is only for escalation purposes.

The third part is the bottom right. This test is designed to check if the Printhead nozzles print correctly. The test prints out every single nozzle of each Printhead. No error hiding or Printhead Alignment algorithm is applied. For each Printhead, you can see both the adjacent and the consecutive nozzles.

This is what you would see in this third part if there are nozzles not printing correctly:

1. On the right of each Printhead Nozzle test, there is a series of numbered stepped diagonal lines. If one or more of the nozzles are malfunctioning or mis-positioned, you will see that the stepped lines are broken or misdirected in one or more places.
2. On the left of each Printhead Nozzle test, there is a series of horizontal straight lines. If one or more nozzles are misdirected there will be unequal spaces between the corresponding lines

To fix issues found in this third part:

NOTE: If the printer has nozzle defects, it does not mean that you will not get perfect print quality results. The printer has automatic procedures to hide many nozzle defects.

1. Recover the Printheads using the option through the Front Panel (Main menu/Image quality maintenance/clean Printheads).
2. Reprint the Nozzle Print test to check that the defective nozzles have been corrected.
3. If the problem continues, replace the faulty Printhead.

Advance Diagnostic: Force Drop Detection

If Nozzle Print Test plot has persistent white point banding in only one color that cannot be fixed with a recovery you can use this option to resolve the problem by resetting the nozzle health data base so that all nozzles are assumed to be correct.

Once the nozzle health data base has been reset drop detection is forced.

The normal cause of this white point banding in a single color is the incorrect detection of failed nozzles by the drop detector.

This tool is also helpful to diagnose a potential failure of the drop detector. How? From the first firmware release after introduction, the 'force drop detector tool' will also report the number of nozzles out per printhead. If just after you print the diagnostic plot image, you will be able to compare this number detected by the drop detector with the real number of nozzles out that you see on the printout.

If there is a mismatch on all the colors, there is a high probability that the drop detector is not working well or it is not positioned correctly. Before replacing the drop detection, to a 'drop detector calibration' to correctly position it. If the failure (miss-match) is still confirmed after the calibration, replace the drop detector.

Advanced Diagnostics: Disable Paper Advance Sensor

This option allows the disabling of the Paper Advance Sensor and forces the advance control to use the analog encoder system. The Paper Advance sensor will come back to work after the unit will be rebooted.

General advice

When you have any print-quality problem:

- To achieve the best performance from your printer, use only genuine manufacturer's supplies and accessories, whose reliability and performance have been thoroughly tested to give trouble-free performance and best-quality prints.
- Make sure that the paper type selected in the front panel is the same as the paper type loaded into the printer. To check this, use the View loaded paper key on the front panel. At the same time, check that the paper type has been calibrated. Also make sure that the paper type selected in your software is the same as the paper type loaded into the printer.

NOTE: If you have the wrong paper type selected, you could experience poor print quality and incorrect colors, and perhaps even damage to the printheads.

- Check that you are using the most appropriate print-quality settings for your purposes. See Select print quality on User Guide. You are likely to see lower print quality if you have

moved the print-quality slider to the 'Fast' end of the scale, or set the custom quality level to **Fast**.

- Check that your environmental conditions (temperature, humidity) are in the recommended range.
- Check that your ink cartridges and printheads have not passed their expiration dates.
- Avoid touching the paper while printing is in progress

Fix paper advance issues

Z6100 printers have a Paper Advance Sensor system that corrects the advance error automatically. This system avoids the use of the traditional advance calibration system.

However, there are some types of paper where this system cannot operate correctly because the type of material used for the paper. To work with these types of paper the traditional advance system based on an Analog Encoder Sensor is provided in the printer. This analog encoder calibration requires the Advance Calibration (carried out at the factory or in service through the service menu) to work properly.

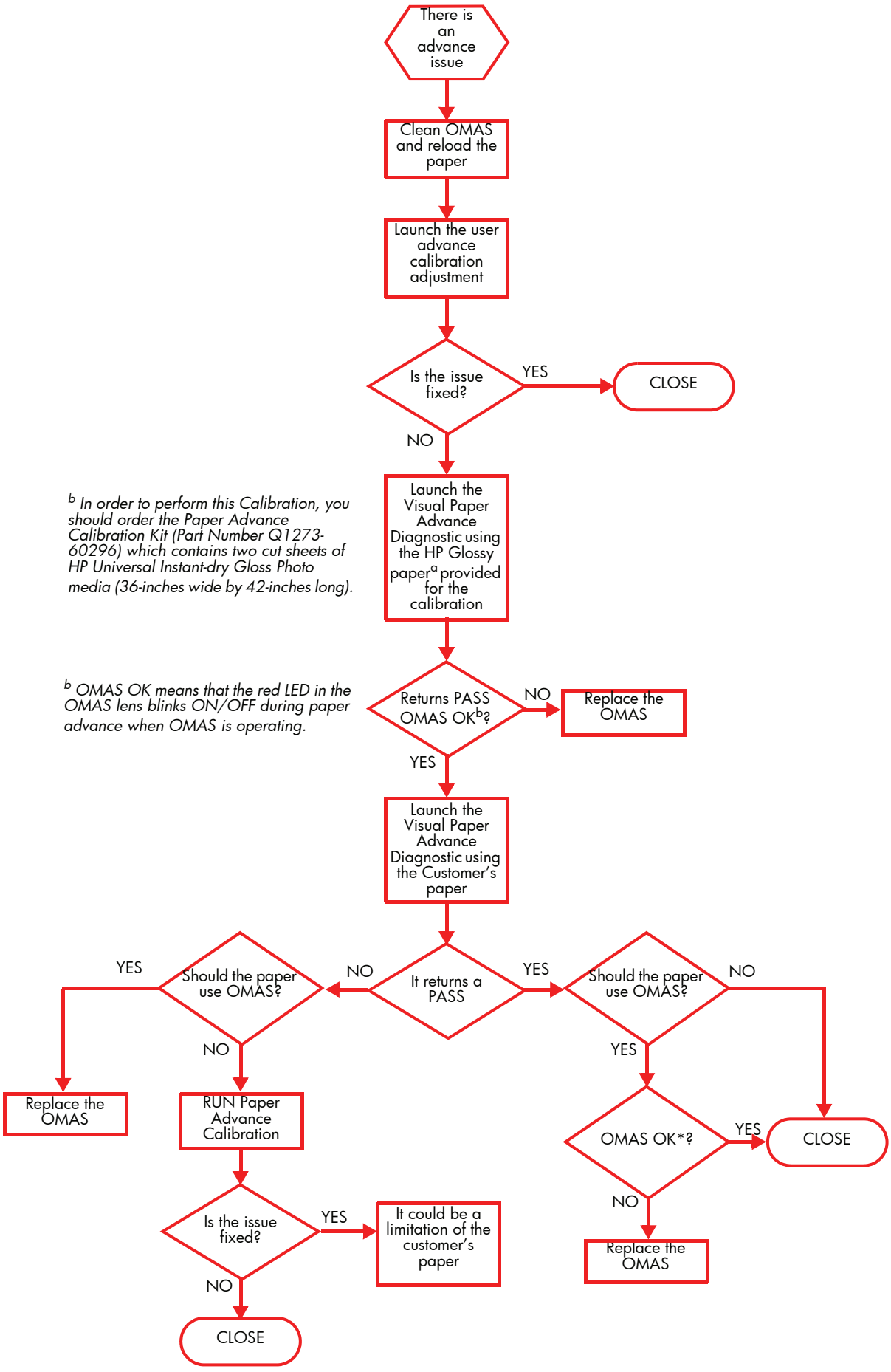
Some of the papers type that will not work with the new Paper Advance Sensor are:

- Clear Film
- Backlit
- Some types of Matte film
- Some types of Polypropylene

To check if your paper can use the Paper Advance Sensor go to the *Service Menu> Diagnostic print> Others > Visual Paper Advance Diagnostic*. The test will allow you to check with advance control is used.

The flow to fix and advance issues is as follows:

NOTE: The reference paper to use for the Paper Advance Calibration is HP Universal Photo Gloss. If the customer does not have this media, order support part: Q1272-60296 (Inst. dry photo glossy Calibration Sheets).



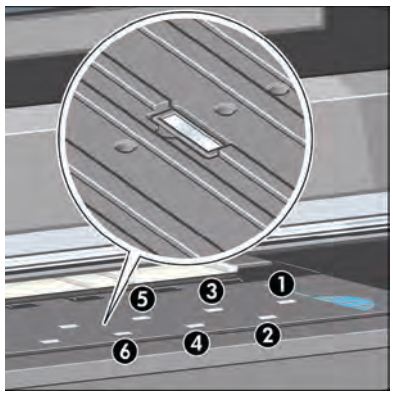
[b] In order to perform this Calibration, you should order the Paper Advance Calibration Kit (Part Number Q1273-60296) which contains two cut sheets of HP Universal Instant-dry Gloss Photo media (36-inches wide by 42-inches long).

[b] OMAS OK means that the red LED in the OMAS lens blinks ON/OFF during paper advance when OMAS is operating.

Clean the paper advance sensor window

The paper advance sensor is the very small rectangular window (less than 1 square centimeter in size and shown in the graphic below) found near the sixth platen roller from the right.

Very gently wipe off any dust and loosened ink deposits from the sensor window, using a clean, absorbent, lint-free cloth, slightly dampened with isopropyl alcohol.



User Advance Calibration.

If the paper is not advanced the proper distance between printhead passes, light or dark bands appear in the print and image grain may increase.

The printer is calibrated to advance correctly with all the papers appearing in the front panel. When you select the type of loaded paper, the printer adjusts the rate at which to advance the paper while printing. However, if you are using custom paper or not satisfied with the default calibration of your paper, you may need to calibrate the rate at which the paper advances.

You can check the paper advance calibration status of the currently loaded paper at any time. To do so, select the Paper icon, then View loaded paper > View paper details. The status may be one of the following.

- DEFAULT: this status appears when loading an HP paper. HP papers in the front panel have been optimized by default and unless you experience image quality problems in your printed image such as banding or graininess it is not recommended to calibrate the paper advance.
- RECOMMENDED: this status appears when a new paper is created. The paper advance values for this paper are inherited from the family type. In these cases it is recommended you perform a paper advance calibration to optimize the values.
- OK: this status indicates that the loaded paper has been calibrated before. However you may need to repeat the calibration if you experience image quality problems such as banding or graininess in your printed image.

NOTE: Whenever you update the printer's firmware, the paper advance calibration values will be reset to factory default.

NOTE: Colored papers and transparent materials such as translucent bond, clear film, matte film, tracing paper, and vellum are not suitable for paper advance calibration.

NOTE: User advance calibration works in both advance control systems: paper advance sensor and analog encoder system.

Overview of the user paper advance procedure

If your paper is not suitable for the paper advance calibration, override point 1 and 2 (Calibrate Paper Advance) and go directly to point 3 (Adjust Paper Advance)

1. At the front panel, select the icon, then Image quality maintenance > Paper advance calibration > Calibrate paper advance. The printer automatically calibrates the paper advance and prints a paper advance calibration image.
2. Wait until the front panel displays the status screen and re-print your print.

NOTE: The calibration procedure takes approximately three minutes. Do not worry about the paper advance calibration image. The front-panel display shows any errors in the process.

If you are satisfied with your print continue using this calibration for your paper type. If you see improvement in your print, continue with step three.

If you are dissatisfied with the calibration, return to the default calibration.

3. If you would like to fine-tune the calibration, select the icon, then Image quality maintenance > Paper advance calibration > Adjust paper advance.
4. Select the percentage of change from -100% to 100%. To correct light banding, decrease the percentage. To correct dark banding, increase the percentage.
5. Press the OK key on the front panel, to save the value.
6. Wait until the front panel displays the status screen and re-print your print.

Return to default calibration

Returning to the default calibration sets all the corrections made by the paper advance calibration to zero. To return to the default paper advance calibration value, you must reset the calibration.

1. At the front panel, select the icon, then Image quality maintenance > Paper advance calibration > Reset paper advance.
2. Wait until the front panel displays the operation has completed successfully before pressing the Back key to return to the main menu.

Visual Paper Advance Diagnostics

This test will launch a plot and will check with the line sensor the advance error. It will return a PASS/FAIL based on the error read. The test prints first a pattern and then checks the error with the line sensor. In the case that the Paper Advance Sensor will be working, it will check in parallel the parameters reported by of the Paper Advance Sensor and will display in the front panel the status of the sensor.

To launch the diagnostics go to the Service Menu> Diagnostic print> Others > Visual Paper Advance Diagnostic

In the debugging process we first launch the process in a paper that we know works with the Paper Advance Sensor. This is the paper delivery to do the repair and is the same paper user for the Paper Advance Calibration that use the analog encoder.

The result of the test with this paper has to be a “PASS” and the Status of the Paper Advance Sensor has to be “Working and OK”. If it is not the case, then we have to go to the Paper Advance Sensor troubleshooting to be repaired.

Once we know that the Paper Advance Sensor is working with the reference paper, we have to do the same process but with the customer paper.

We have then five possible results of the Paper Advance Sensor:

- "PASS" and Sensor is "Working & OK".

The issue is not related to paper advance control

- "PASS" but Sensor is "Not Working OK". If the paper is one of the next one:
  - HP or HP-approved Clear Film,
  - HP or HP-approved Backlit
  - HP or HP-approved some types of Matte film
  - HP or HP-approved some type of Polypropylene
  - A non HP or HP-approved paper

Then, all is OK and the issue is not related to paper advance control

- "PASS" but Sensor is "Not Working OK" and the paper is not included in the above list: Then, it is recommended to repair the Paper Advance Sensor system.

The issue is that the paper is controlled by the analog encoder system when should be the paper advance sensor, which always provide a more accurate advance control.

- "FAIL" and the paper is one of the next one:
  - HP or HP-approved Clear Film,
  - HP or HP-approved Backlit
  - HP or HP-approved some types of Matte film
  - HP or HP-approved some type of Polypropylene
  - A non HP or HP-approved paper

Then, do a Paper Advance Calibration in the Service Menu.

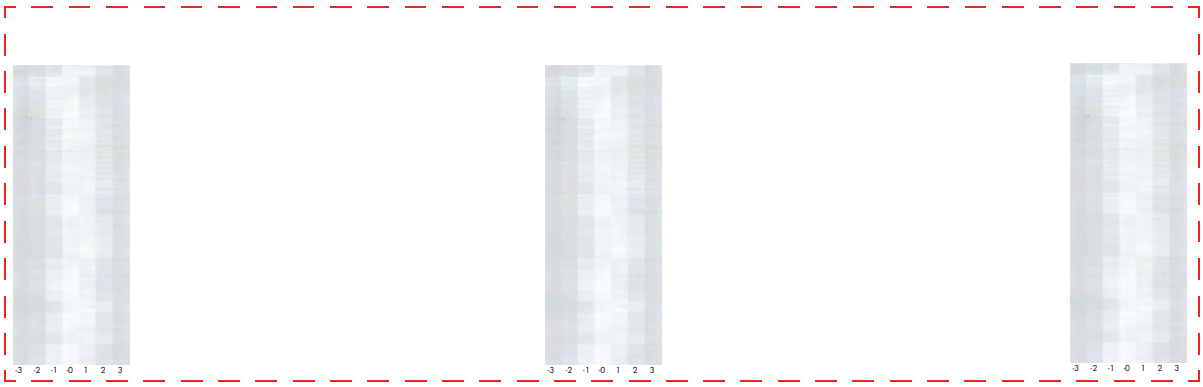
If after that a non HP or HP-approved paper continues having advance issue, it could be a limitation of this type of the paper that cannot use neither the Paper Advance Sensor (which was tested with an HP paper previously) nor Analog Encoder control system.

- "FAIL" and the paper is not included in the above list:

Then, it is recommended to repair the Paper Advance Sensor system.

Advance Diagnostic: Visual Paper Advance Diagnostic

The Visual Paper Advance Diagnostic prints a test plot to verify that the paper advance is operating correctly. The plot is accessible from Service Utilities submenu> Diagnostic Print> Others> Visual Paper Advance Diagnostic menu option. It consists of three plots printed at the left, center, and right of the paper. These three plots are the same and contain seven numbered columns. The following illustrations shows an example of the Visual Paper Advance Diagnostic plot.

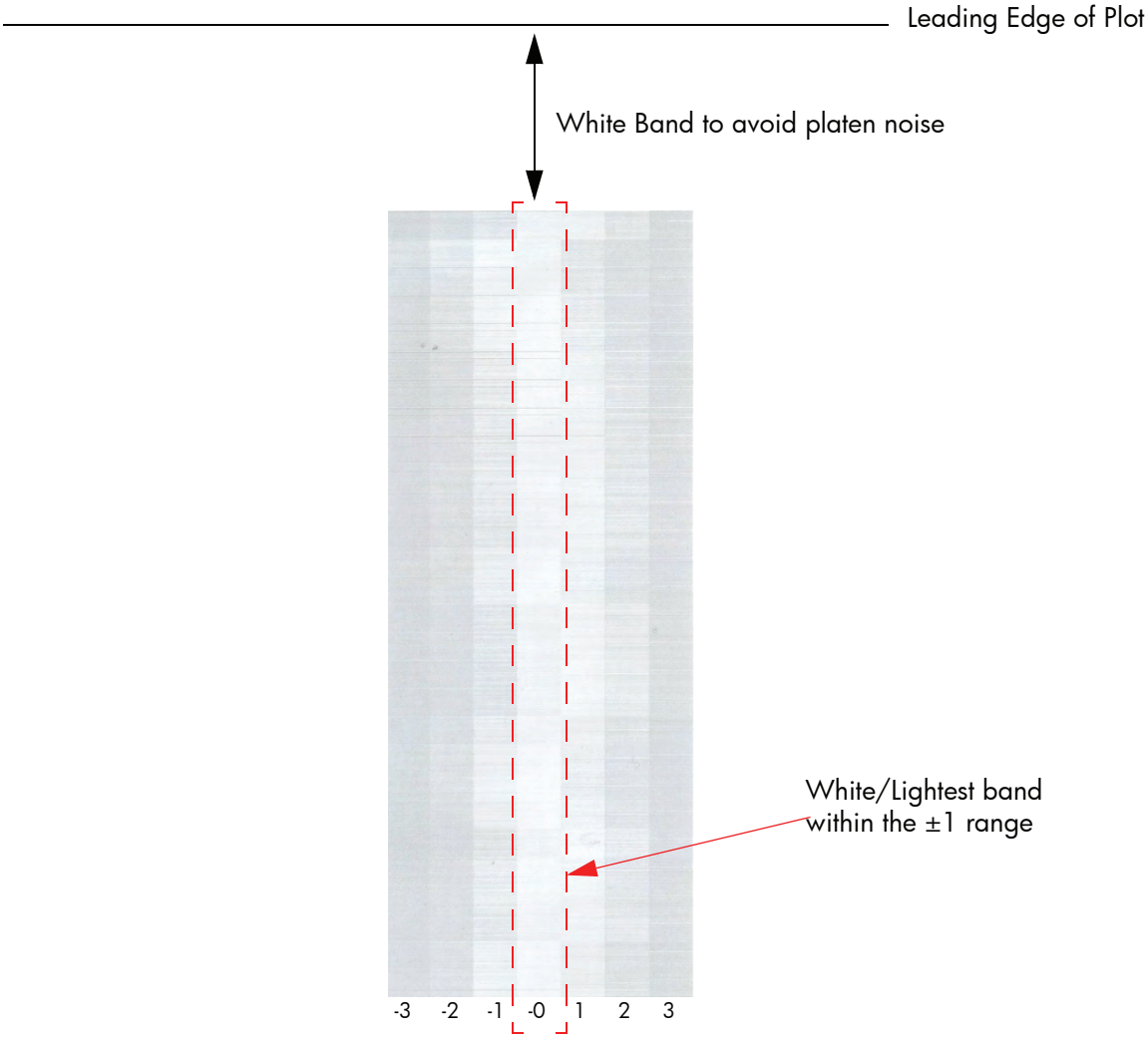


Interrupting plot results

The three plots are all printed using Photo Black ink in 6-pass print mode (even on Gloss paper) and should should each be similar. The white/lightest band of must be within the center ±1 area for a PASS result. This should be true for all three plots or the printer will have differential banding (a difference of advance between the left and right). There is a 3-inch white band before the plots to ensure there is no platen noise causing advance errors while the media is covering the platen.

Example PASS plot

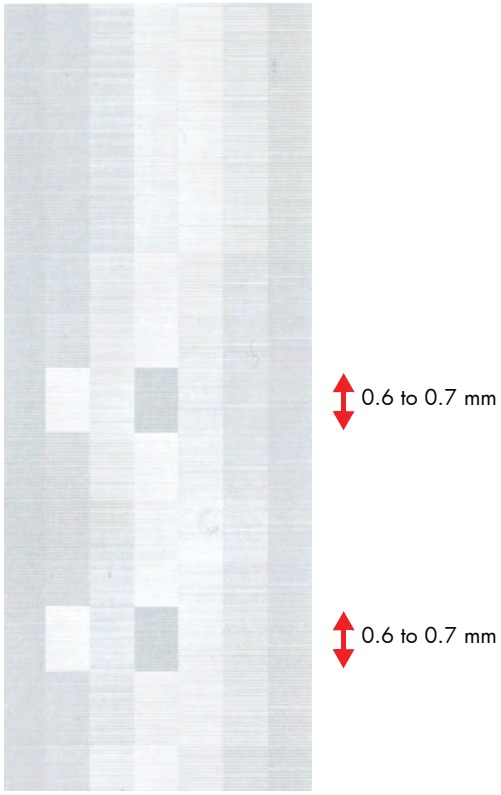
The following illustration shows an example of a PASS plot.



Example defective advance plot

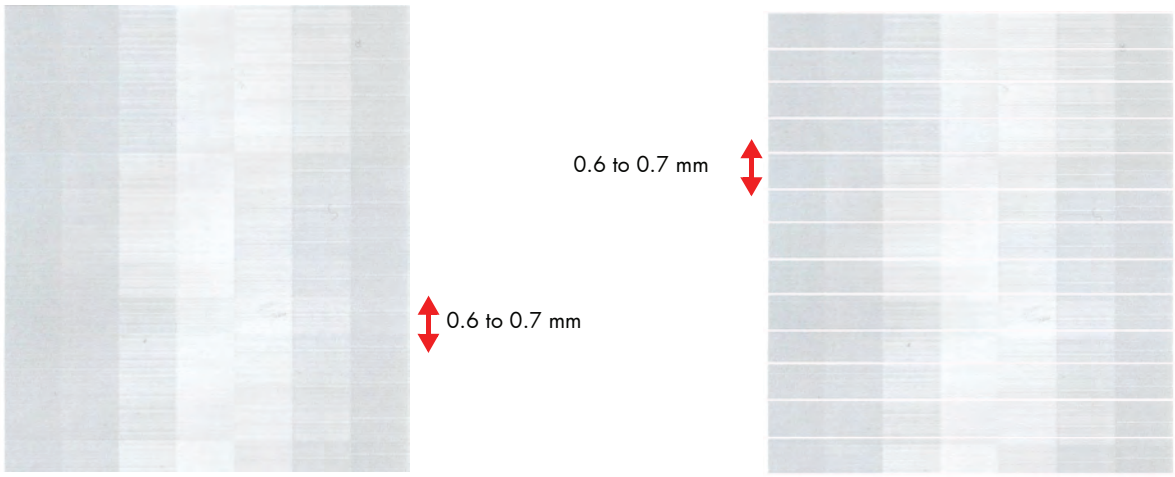
This defect has the follow possible causes:

- OMAS is not clean or is defective so you should repeat the plot with OMAS disabled. This will allow you to establish if this is an OMAS related fault. If the same fault is detected the problem cannot be attributed to OMAS.
- The Drive roller is not clean so it slips against the media.
- Any other component affecting the media advance:
  - Spindle/Back Tension
  - Input roller
  - Pinchwheels

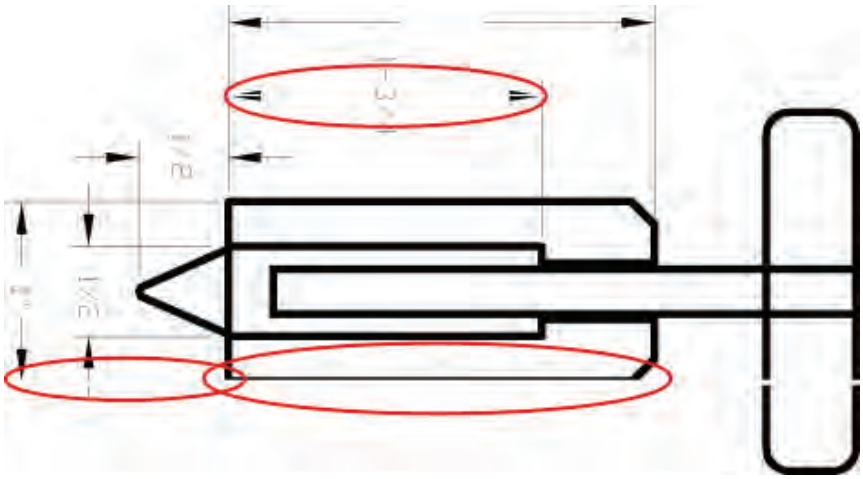


Example defective nozzle plot

This example is caused by a defective nozzle so there is no issue with the paper advance.



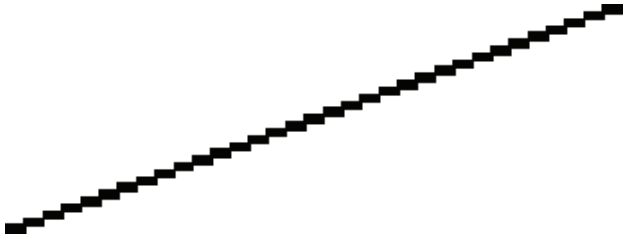
Lines are too thick, too thin, or missing



1. Check that the paper type you have loaded corresponds to the paper type selected in the front panel and in your software. To check on the front panel, use the View loaded paper key.
2. Check that you are using appropriate print-quality settings for your purposes. See Select print quality on User Guide.
3. If the resolution of your image is greater than the printing resolution, you may notice a loss of line quality. You can find the Max. Application Resolution option in the Windows driver dialog's Advanced tab, under Document Options > Printer Features. If you change this option, you may wish to reprint your job at this point in case the problem has been solved.
4. If lines are too thin or missing, print the Image Diagnostics Print.
5. Try aligning the printheads. After alignment, you may wish to reprint your job in case the problem has been solved.
6. Select the icon from the printer's front panel, then View loaded paper to see the paper advance calibration status. If the status is PENDING, you should perform paper advance calibration if the paper does not use OMAS advance control.

Lines appear stepped or jagged

If lines in your image appear stepped or jagged when printed:



1. The problem may be inherent in the image. Try to improve the image with the application you are using to edit it.
2. 2.Check that you are using appropriate print-quality settings. See Select print quality on User Guide
3. Change your image rendering resolution to 300 dpi or 600 dpi depending on your printing needs. You can find the Max. Application Resolution option in the Windows driver dialog's Advanced tab, under Document Options > Printer Features.

Parts of lines or text are missing

Large quantities of data may be necessary to print a high-quality large format print job, and in some specific workflow there may be issues that can lead to some objects missing from the output. Here are some suggestions to help you to avoid this problem.

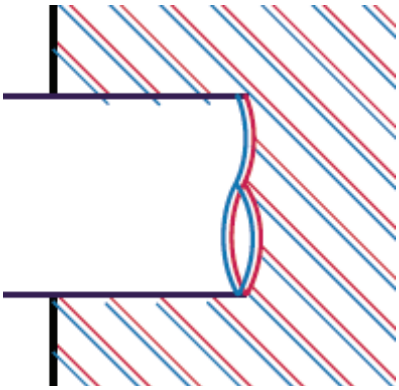
- Select a smaller page size and scale to the desired final page size in the driver or in the front panel.
- Save the file in another format, such as TIFF or EPS, and open it with another application.
- Use a RIP to print the file.
- Reduce the resolution of bitmap images in your application software.
- Select a lower print quality in order to reduce the resolution of the printed image.
- In the Advanced tab of the Windows driver dialog, select Document options, Printer features, then:
  - Set Send job as bitmap to Enabled (HP-GL/2 driver only).
  - Set 16-bit App. Compatibility to Enabled.
  - Set Max. Application resolution to 300.

NOTE: The above settings are mentioned for troubleshooting purposes and may adversely affect the final output quality or the time necessary to generate the print job. Therefore, they should be restored to their default values if they do not help to solve the problem.

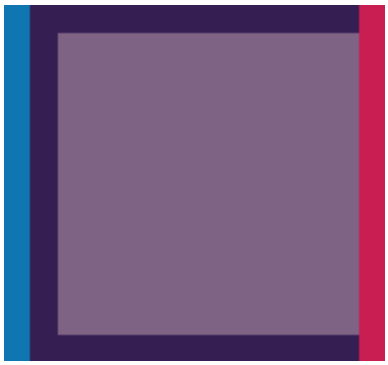
Lines are printed double or in wrong colors

This problem can have various visible symptoms:

- Colored lines are printed double, in different colors.



- The borders of colored blocks are wrongly colored.



To correct this kind of problem:

1. Align the printheads.
2. Check that you are using appropriate print-quality settings.

Lines are blurred (ink bleeds from lines)

Humidity can cause ink to soak into the paper, making the lines blurred and fuzzy. Try the following:

1. Check that your environmental conditions (temperature, humidity) are suitable for high-quality printing.

2. Check that the paper type selected in the front panel is the same as the paper type you are using. To check, select the icon from the printer's front panel, then View loaded paper.
3. Try changing to a heavier paper type, such as HP Heavyweight Coated Paper, HP Super Heavyweight Coated Paper, or Digital Fine Art paper.
4. If you are using glossy paper, try changing to a different type of glossy paper.
5. Align the printheads.

Lines are slightly warped

The paper itself may be warped. This can happen if it has been used or stored in an extreme environment.

Dark or light horizontal lines across the image (banding)

If your printed image suffers from added horizontal lines as shown (the color may vary):

1. Check that the paper type you have loaded corresponds to the paper type selected in the front panel and in your software. To check on the front panel, use the View loaded paper key.
2. Check that you are using appropriate print-quality settings for your purposes. See Select print quality on User Guide. In some cases, you can overcome a print-quality problem merely by selecting a higher print quality level. For instance, if you have set the print-quality slider to Fast, try setting it to Best. If you change the print-quality settings, you may wish to reprint your job at this point in case the problem has been solved.
3. Print the Image Diagnostics Print. See Use the Image Diagnostics Print.
4. If the printheads are working correctly, go to the front panel and press the View loaded paper key to see the paper advance calibration status. If the status is PENDING, you should perform paper advance calibration if the paper does not use OMAS advance control.

The image is grainy.

1. Check that the paper type you have loaded corresponds to the paper type selected in the front panel and in your software. To check on the front panel, use the View loaded paper key.
2. Check that you are printing on the correct side of the paper.
3. Check that you are using appropriate print-quality settings. See Select print quality on User Guide. In some cases, you can overcome a print quality problem merely by selecting a higher print-quality level. For instance, if you have set the print-quality slider to Fast, try setting it to Best. If you change the print-quality settings, you may wish to reprint your job at this point in case the problem has been solved.
4. Try aligning the printheads. After alignment, you may wish to reprint your job in case the problem has been solved.
5. Go to the front panel and press the View loaded paper key to see the paper advance calibration status. If the status is PENDING, you should perform paper advance calibration if the paper does not use OMAS advance control.

The image has a metallic hue (bronzing)

Bronzing is a term used to describe an image that has a metallic hue when viewing it from specific angles, as if the print were made of bronze. Bronzing occurs most commonly when printing pigmented inks on non-matte paper such as photo paper. If your image is bronzing, and you are using standard print-quality options, ensure that the slider is set to Quality. See Select print quality on User Guide.

If you are experiencing bronzing when printing grayscale images on glossy paper, try using the Full Set of Inks printing option. To do so from the Windows driver, select the Color tab and select Print In Grayscale, then select the Full Set of Inks option from the drop-down menu.

The printed output is not flat

If the paper does not lie flat when it comes out of the printer, but has shallow waves in it, you are likely to see defects in the printed image, such as vertical stripes. This can happen when you use thin paper that becomes saturated with ink

1. Check that the paper type you have loaded corresponds to the paper type selected in the front panel and in your software. To check on the front panel, use the View loaded paper key.
2. Try changing to a thicker paper type, such as HP Heavyweight Coated paper, HP Super Heavyweight Coated Paper, or thicker Digital Fine Art papers.

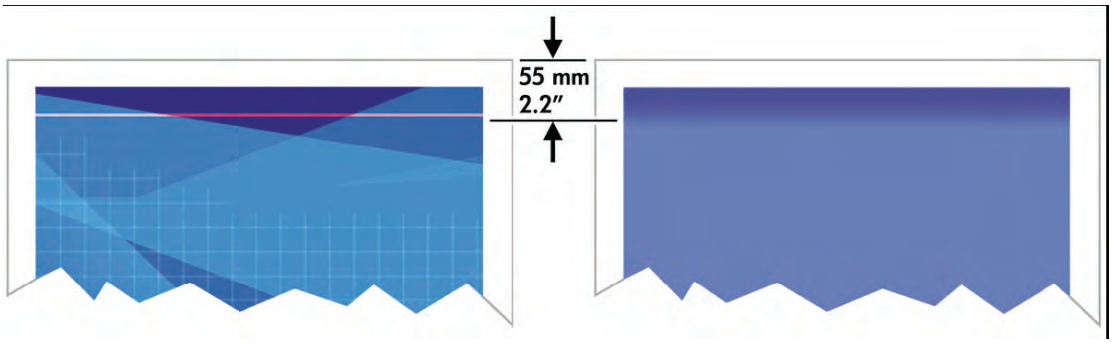
The print smudges when touched

The black ink pigment can smudge when touched by a finger or pen. This is particularly noticeable on the following materials: vellum, translucent bond, films, productivity photo paper, and natural tracing paper. To reduce the smudging:

- Try to print in an environment which is not too humid for the printer
- Change pure black objects in your image to a dark color, such as dark brown, so that they will be printed with colored inks instead of black ink
- Use HP Heavyweight Coated
- Increase the drying time

Defects near the top of a print

There is a type of defect that affects only the start of a print, within 5.5 cm of the leading edge of the paper. You may see a thin or thick band of inconsistent color



To avoid this problem:

1. The easiest solution may be to select the Extended Margins option in the driver, the Embedded Web Server, or the front panel. This means that the area of the paper affected by the problem (at the start of the page) may no longer be printed on. See Adjust margins and layout options on User Guide.
2. Align the printheads.
3. Check that you are using appropriate print-quality settings.

There are ink marks on the paper

This problem may occur for several different reasons.

Smears on the front of coated paper

If a lot of ink is used on coated paper, the paper absorbs the ink quickly and expands. As the printheads move over the paper, the printheads come into contact with the paper and the printed image is smeared.

Whenever you notice this problem, you should cancel the printing job. Press the Cancel key on the front panel and also cancel the job from your computer application. Otherwise the soaked paper may damage the printheads.

Try the following suggestions to avoid this problem:

- Use a recommended paper type
- If the image you are printing contains intense color, try using HP Heavyweight Coated Paper
- Use extended margins (see Adjust margins and layout options on User Guide), or try to increase the margins by relocating the image within the page using your software application
- If necessary, try changing to a non-paper-based material such as transparent film

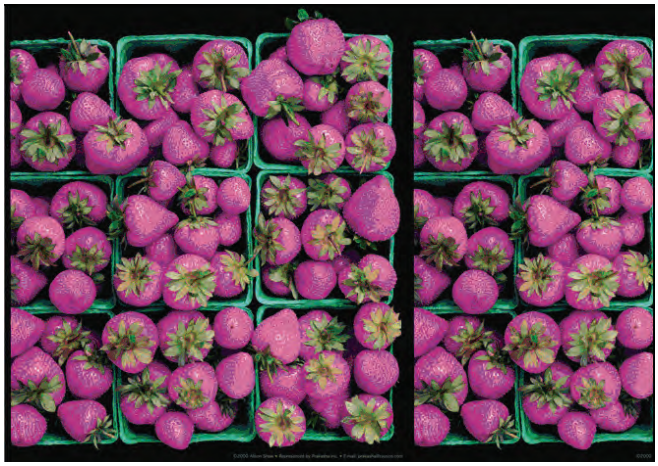
Smears or scratches on the front of glossy paper

Glossy paper may be extremely sensitive to the bin or to anything else that it contacts soon after printing. This will depend on the amount of ink printed and the environmental conditions at the time of printing. Avoid any contact with the paper surface and handle the print with care.

Ink marks on the back of the paper

Ink residues on the platen or on the input rollers are likely to mark the back of the paper.

Colors are inaccurate



If the colors of your print do not match your expectations, try the following:

1. Check that the paper type you have loaded corresponds to the paper type selected in the front panel and in your software. To check on the front panel, use the View loaded paper key. At the same time, check the color calibration status. If the status is RECOMMENDED or OBSOLETE, you should perform color calibration. If you have made any changes, you may wish to reprint your job in case the problem has been solved.
2. Check that you are printing on the correct side of the paper.
3. Check that you are using appropriate print-quality settings. See Select print quality on User Guide. If you have selected the Fast options, you may not get the most accurate colors. If you change the print-quality settings, you may wish to reprint your job at this point in case the problem has been solved.
4. If you are using Application Color Management, check that the color profile you are using corresponds to the selected paper type and print quality settings.
5. If the problem consists of color differences between your print and your monitor, please follow the instructions in the “How to calibrate your monitor” section of the HP Color Center. At this point, you may wish to reprint your job in case the problem has been solved.
6. Print the Image Diagnostics Print.

If none of the above solutions fix the problem and the customer notices a slight degradation over time you should consider replacing the Color Sensor. (

Colors between different HP Designjets do not match

If you print an image on two different printer models (for instance, on an HP Designjet Z6100 Photo printer series and an HP Designjet 4000 printer series), you may find that the colors of the two prints do not match well.

Matching two printing devices that use different ink chemistry, paper chemistry, and printheads is unlikely to be completely successful. The information provided here is the best way to emulate one printer with another. Even so, the end result may not be a perfect match.

Print via separate PostScript drivers

The situation is that you are printing on each printer using the PostScript driver installed for that printer. In this example, we are using an HP Designjet Z6100 Photo printer series and an HP Designjet 4000 printer series.

1. Ensure that both printers have been updated to the latest firmware version.
2. Ensure that you have the latest printer driver for both printers. You can download the latest versions for any HP printer from www.hp.com/go/designjet.
3. Ensure that Color Calibration is turned on. At the front panel of the HP Designjet Z6100, select the icon, then **Printer configuration** > **Color calibration** > **On**.
4. Load the printers with similar paper types.
5. Ensure that the Paper Type setting on the front panel corresponds to the paper you have loaded.
6. Print your image on the HP Designjet 4000 using your normal settings.
7. Now prepare to print the same image on the HP Designjet Z6100.
8. In your application, set the color space of the image to emulate the HP Designjet 4000 and the specific paper type that you used in that printer. The data sent to the driver must be already converted to this emulation color space, which is a CMYK color space. See your application's online help for information on how to do this. In this way, the Z6100 will emulate the colors that the 4000 can produce when printing on that paper type.
9. In the PostScript driver for the HP Designjet Z6100, go to the Color Management section and set the CMYK input profile to the same HP Designjet 4000 color space that you selected in the application (the emulation color space).

NOTE: When trying to emulate another printer you should always use CMYK colors, not RGB.

10. Set the rendering intent to Relative Colorimetric, or to Absolute Colorimetric if you want to emulate the whiteness of the paper.
11. Print the image on the HP Designjet Z6100.

Print via separate HP-GL/2 drivers

The situation is that you are printing on each printer using the HP-GL/2 driver installed for that printer.

1. Ensure that both printers have been updated to the latest firmware version.
2. Ensure that you have the latest printer driver for both printers. You can download the latest versions for any HP printer from www.hp.com/go/designjet.
3. Ensure that Color Calibration is turned on. At the front panel of the HP Designjet Z6100, select the icon, then Printer configuration > Color calibration > On.
4. Load the printers with similar paper types.
5. Ensure that the Paper Type setting on the front panel corresponds to the paper you have loaded.
6. With the HP-GL/2 driver for the HP Designjet Z6100, select the Color tab, and select Printer Emulation from the list of color management options. Then choose the HP Designjet 4000 from the list of emulated printers.

7. With the HP-GL/2 driver for the HP Designjet 4000, select the Options tab, then Manual Color > Color Control > Match Screen. You should also select the Paper Size tab, then Paper Type.

Print the same HP-GL/2 file

The situation is that you have produced an HP-GL/2 file (also known as a PLT file) using the HP-GL/2 driver installed for one printer, and you intend to send the same file to both printers.

1. Ensure that both printers have been updated to the latest firmware version.
2. Ensure that Color Calibration is turned on. At the front panel of the HP Designjet Z6100, select the  icon, then Printer configuration > Color calibration > On.
3. Load the printers with similar paper types.
4. Ensure that the Paper Type setting on the front panel corresponds to the paper you have loaded.
5. If you have an HP-GL/2 file produced for an HP Designjet 4000 and you want to print it on an HP Designjet Z6100, proceed as follows using the Embedded Web Server or the front panel.

- Using the Embedded Web Server: leave the color options set to Default.

Using the front panel: select the  icon, then Default printing options > Color options > Select RGB input profile > HP Designjet 4000 Series.

For other HP Designjet printers, set both printers to match the screen colors (sRGB if selectable), as when printing with separate HP-GL/2 drivers.

The output is completely blank

If the front-panel graphic language setting is Automatic (the default), try the other settings: PostScript for a PostScript file, HP-GL/2 for an HP-GL/2 file, etc. Then send the file again.

When you have finished this particular print, remember to reset the graphic language to Automatic.

The output contains only a partial print

- If you pressed Cancel before all the data were received by the printer, you ended the data transmission and will have to print the page again.
- The I/O time-out setting may be too short. This setting determines how long the printer waits for the computer to send more data, before deciding that the job is finished. From the front panel, increase the I/O time-out setting to a longer period and then send the print again. From the front panel, select the  icon, Connectivity menu > Advanced > Select I/O time-out.
- There may be a communications problem between your computer and the printer. Check your USB or network cable.
- Check to make sure that your software settings are correct for your current page size (for example, long-axis prints).
- If you are using network software, make sure it has not timed out.

The image is clipped

Clipping normally indicates a discrepancy between the actual printable area on the loaded paper and the printable area as understood by your software. You can often identify this kind of problem before printing by previewing your print.

- Check the actual printable area for the paper size you have loaded. printable area = paper size - margins
- Check what your software understands to be the printable area (which it may call "printing area" or "imageable area"). For example, some software applications assume standard printable areas that are larger than those used in this printer.
- If you have defined a custom page size with very narrow margins, the printer may impose its own minimal margins, clipping your image slightly. You may want to consider using a larger paper size.
- If your image contains its own margins, you may be able to print it successfully by using the Clip Contents by margins option.
- If you are trying to print a very long image on a roll, check that your software is capable of printing an image of that size.
- You may have asked to rotate the page from portrait to landscape on a paper size that is not wide enough.
- If necessary, reduce the size of the image or document in your software application, so it fits between the margins.

There is another possible explanation for a clipped image. Some applications, such as Adobe Photoshop, Adobe Illustrator, and CorelDRAW, use an internal 16-bit coordinate system which means that they cannot handle an image of more than 32,768 pixels. If you try to print an image larger than this from these applications, the bottom of the image will be clipped. To print the whole image, try these suggestions:

- Reduce the resolution so that the whole image requires fewer than 32,768 pixels. The Windows driver dialog includes an option called 16-bit App. Compatibility, which can be used to reduce the resolution of such images automatically. You can find this option in he Advanced tab, under Document Options > Printer Features.
- Save the file in another format, such as TIFF or EPS, and open it with another application.
- Use a RIP to print the file.

The image is in one portion of the printing area

- Have you selected too small a page size in your application?
- Does your application think that the image is in one portion of the page?

The image is unexpectedly rotated

- At the front panel, select the  icon, then Printing preferences > Paper > Rotate. Check that the setting is what you wanted.
- For non-PostScript files: if Nesting is On, pages may be automatically rotated to save paper.

The print is a mirror image of the original

At the front panel, select the icon, then Printing preferences > Paper > Enable mirror. Check that the setting is what you wanted.

The print is distorted or unintelligible

- The interface cable connecting your printer to your network (or to your computer) could be faulty. Try another cable.
- If the front-panel graphic language setting is Automatic (the default), try the other settings: PostScript for a PostScript file, HP-GL/2 for an HP-GL/2 file etc. Then send the file again.
- Depending on the software, drivers, and RIPs you are using with your printer, there will be different ways of solving this problem. Refer to the vendor's user documentation for details.

One image overlays another on the same print

The I/O time-out setting may be too long. From the front panel, decrease the setting and print again. Select the icon, Connectivity menu > Advanced > Select I/O time-out.

Pen settings seem to have no effect

Here are some possible explanations:

- You have changed the settings in the front panel by selecting the icon followed by Printing preferences > HP-GL/2 > Define palette, but you have forgotten to select that palette in Printing preferences > HP-GL/2 > Select palette.
- If you want the software-driven pen settings, you must remember to go to the front panel and select the icon followed by Printing preferences > HP-GL/2 > Select palette > Software.

The image has a wood-grain appearance (aeroworms)

Aeroworms are wavy, horizontal bands produced by air-induced dot placement error (DPE). In extreme cases aeroworms give the image a wood-grain appearance. The problem occurs most commonly on print jobs set for low-quality and high-speed. It will not occur when the custom print quality setting is set to "best."

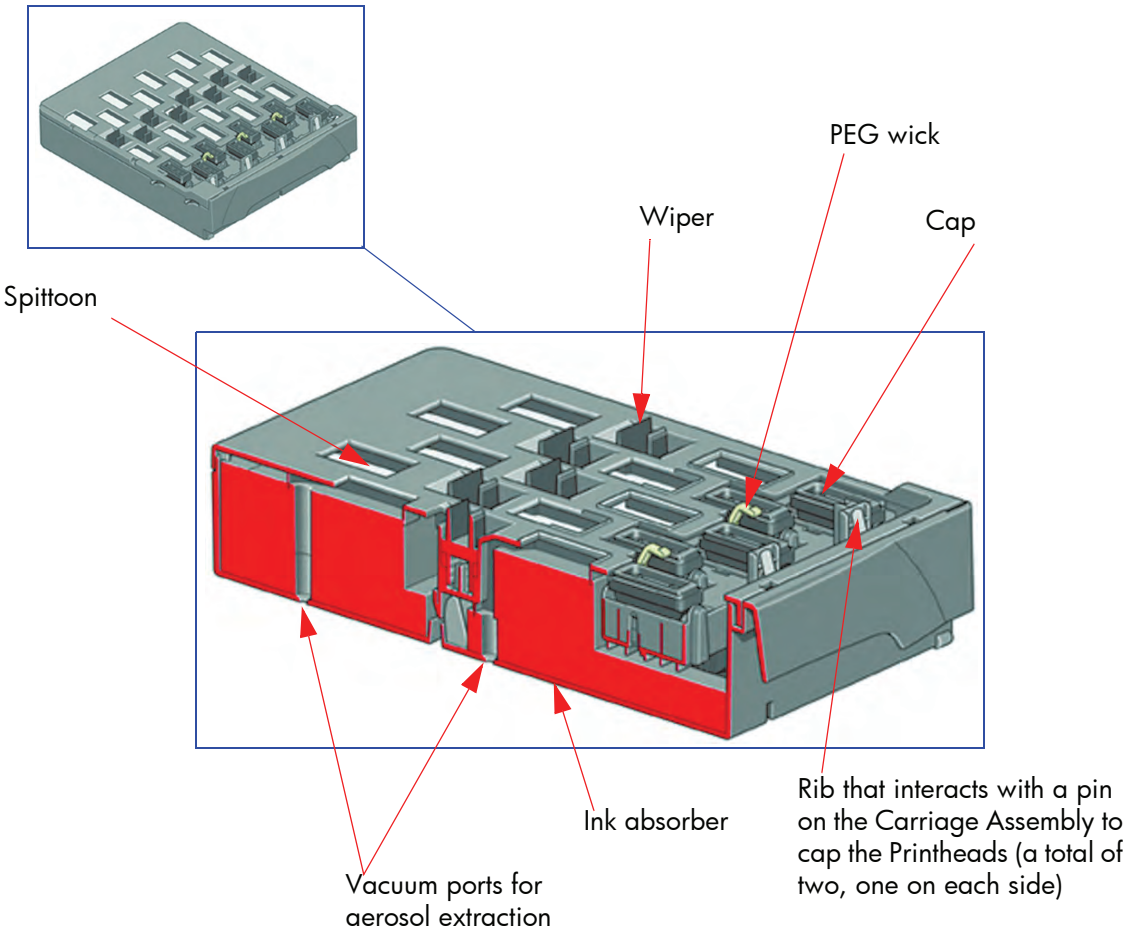
- To eliminate aeroworms, select a higher IQ print setting. See Select print quality in the User's Guide.

Printheads fail repeatedly

If you encounter intermittent quality issues that are not solved after replacing Printheads or repeated replacement of the same Printheads there might be a capping problem. This could be caused damage to the Maintenance Cartridge or even the actual Carriage Assembly which is preventing the Printheads from being correctly capped.

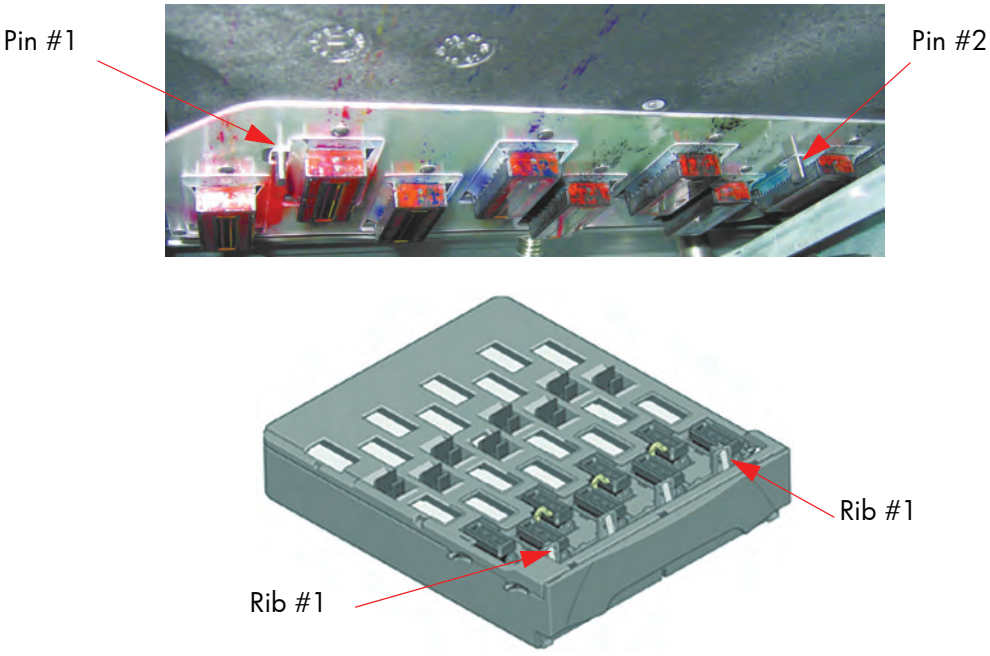
The Maintenance Cartridge provides the capping for all eight Printheads and contains integrated Printhead caps, wipers, cleaners, and waste ink disposal.

The following illustration shows a the components that make up the Maintenance Cartridge.



To cap the Printheads:

- The Carriage Assembly is first positioned over the Service Station.
- The Maintenance Cartridge moves towards the back of the printer which allows Pin #1 and Pin #2 on the Carriage Assembly to push against Rib #1 and Rib #2 to lift the caps into contact with the Printheads.



Improper capping of printheads will occur when any of the following elements break:

- Rib #1 or Rib #2 of the Maintenance Cartridge,
- Pin #1 or Pin #2 of the Carriage Assembly

You should also check all the other elements of the Maintenance Cartridge (plastic of each cap, peg, etc.) and make sure the vacuum ports are clear. If they are blocked, you can clear them with a T-8 Torx bit but you should also check to make sure the Aerosol Fan is operating correctly.