Improve print quality

Improve print quality (315, 335)

As a first step, you may be able to improve print quality with a single command. At the front panel, press , then **Image-quality maintenance** > **Optimize print quality**.

This performs printhead recovery, alignment, and color calibration routines, in order to optimize your print quality automatically in a single step. Allow up to 30 minutes for the printer to perform the whole process.

If you still experience print-quality problems, you can follow a more hands-on print-quality troubleshooting procedure, by printing, interpreting, and performing corrective actions.

You can print all the test plots at once for complete debugging of your print-quality problem. At the front panel, press , then **Image-quality maintenance** > **Print all test plots**.

Alternatively, you can print the test plots individually for specific debugging of nozzle health, alignment, optimizer, or substrate-advance print-quality issues as described below.

Improve print quality (365, 375)

As a first step, you may be able to improve print quality with a single command. At the front panel, press .

You will see the option **Optimize print quality**. This performs printhead recovery, alignment, and color-calibration routines, in order to optimize your print quality automatically in a single step. Allow up to 30 minutes for the printer to perform the whole process.

In the same quick solutions application, in the section **Generic solutions**, you can **Print all test plots** at once for complete debugging of your print-quality problem. Alternatively, in the **Test plots** section, you can print the test plots individually for specific attention to nozzle health, alignment, or substrate-advance issues (see later in this chapter). Also explore the sections **Maintenance routines** and **Image problems**.

If you still experience print-quality problems, you can follow a more hands-on print-quality troubleshooting procedure, by printing, interpreting, and performing corrective actions.

1. Printhead status plot

The printhead status plot consists of patterns that are designed to highlight printhead reliability problems. It helps to determine whether any printhead is experiencing clogging or other problems.

To print this plot, go to the front panel and press , then **Image-quality maintenance** > **Clean printheads** > **Print test plot**. Vinyl, preferably gloss at least 36 inches wide, is recommended for maximum visibility. Other substrate types may not show enough detail to see the optimizer dashes clearly.

The plot consists of small dashes, one for each nozzle on each printhead.
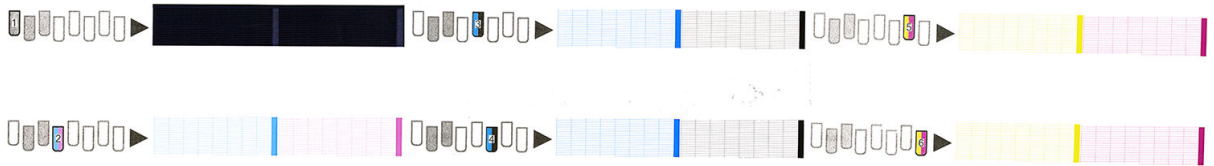
For each individual colored pattern, make sure that most of the dashes are present.

Corrective action

1. Clean any faulty printheads. See [Clean (recover) the printheads on page 132](#). Then reprint the printhead status plot to see whether the problem has been solved.

2. If the problem persists, clean the printheads again, and reprint the printhead status plot to see whether the problem has been solved.

3. If the problem continues to persist, replace any persistently faulty printheads. See [Replace a printhead on page 135](#).

2. Optimizer check plot

To print the optimizer check plot:

1. Use the same substrate type that you were using when you detected a problem.

2. Check that the selected substrate type is the same as the substrate type that is loaded into the printer.

3. Go to the front panel and press [⚙], then **Image-quality maintenance** > **Print latex optimizer test plot**.

The latex optimizer is a transparent fluid that may not be visible on all substrates; vinyl is recommended for maximum visibility. This print consists of several area fills, text, lines and color bars. It is intended to identify print-quality problems that may be caused by optimizer nozzle defects.

a) Compare current performance (=) with simulated situations (–) and (+)
b) Check for optimizer alerts in front panel
c) Refer to the user guide if further assistance is needed

Compare the three rows.

- The row with the ➕ symbol shows a simulated image with an above-normal amount of optimizer.

- The row with the ➖ symbol shows a simulated image with a below-normal amount of optimizer, equivalent to more than 200 blocked nozzles.

- The row with the rectangle around it and the ⬜ symbol shows the current performance of the printer, printing 10 passes.

Look for differences in performance between the images, such as bleeding in the color bars, graininess in the area fills, blurred text, and overall print quality.

If there is little difference in quality between the rows, there are at least two possible explanations:
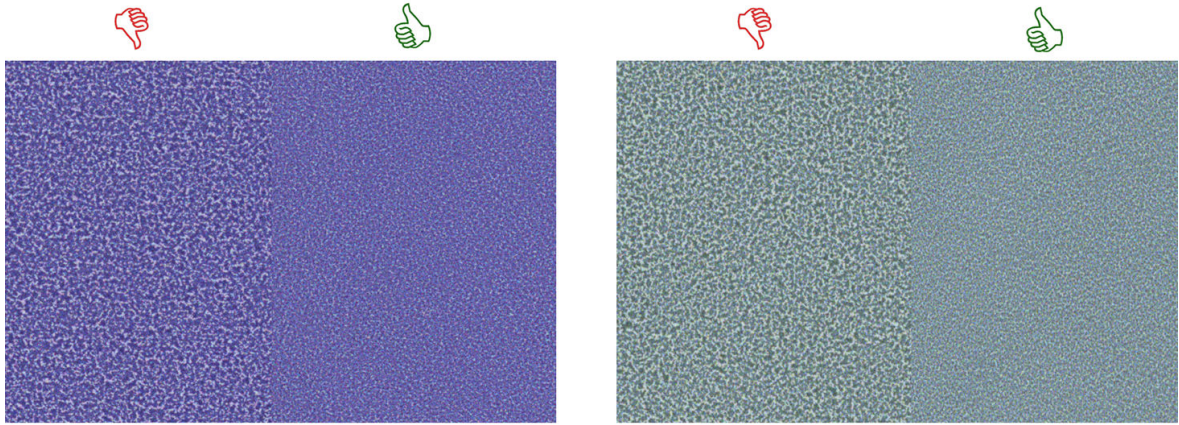
- The substrate is not sensitive to the amount of optimizer. There is probably no problem with the optimizer printhead. Consider other explanations for whatever problem you have.

- There may be a problem with the optimizer printhead if you see high levels of coalescence and bleed as in the bad 👎 examples below. In this case, try to clean the optimizer printhead; see Clean (recover) the printheads on page 132.

📝 **NOTE:** The front panel shows an advisory message if abnormal optimizer performance has been detected.
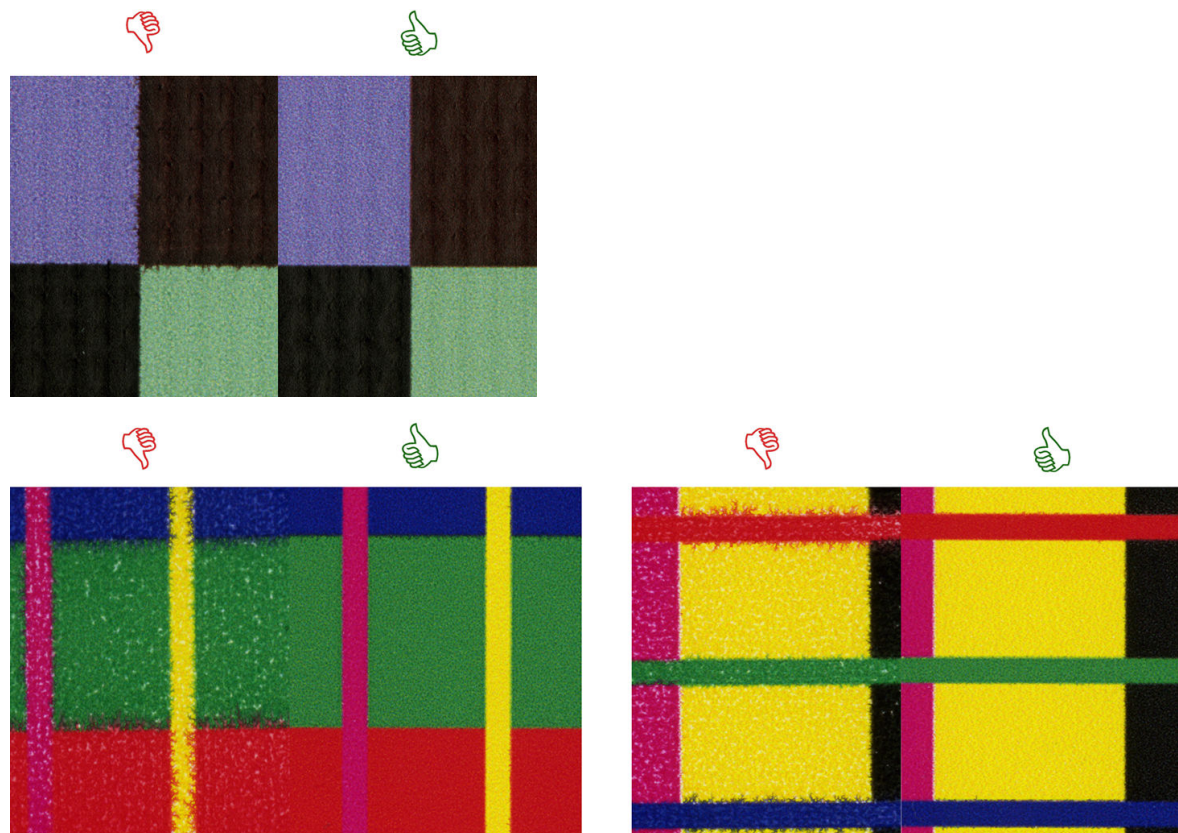
## Bleed Bad vs Good samples

Coalescence Bad vs Good samples

If there is a clear difference in quality between the rows, there are at least two possible explanations:

- If the quality of the row with the ➕ symbol is higher, the substrate is very sensitive to the amount of optimizer. Go to your substrate library on the front panel or in your RIP, select your print mode, and increase the amount of optimizer in the the advanced settings. See Add a new substrate on page 95.

- If you see no difference in quality between the rows with the ➖ and ➕ symbols, but the row with the ➖ symbol looks worse, the substrate is sensitive to the amount of optimizer, but there seems to be no problem with the optimizer printhead or the amount of optimizer used. Consider other explanations for whatever problem you have.

3. Printhead alignment status plot

To print the printhead alignment status plot:

1. Use the same substrate type that you were using when you detected a problem. Or consider using vinyl gloss substrate for better visibility of the optimizer in particular.

2. Go to the front panel and press ⚙, then **Image-quality maintenance** > **Align printheads** > **Print test plot**.
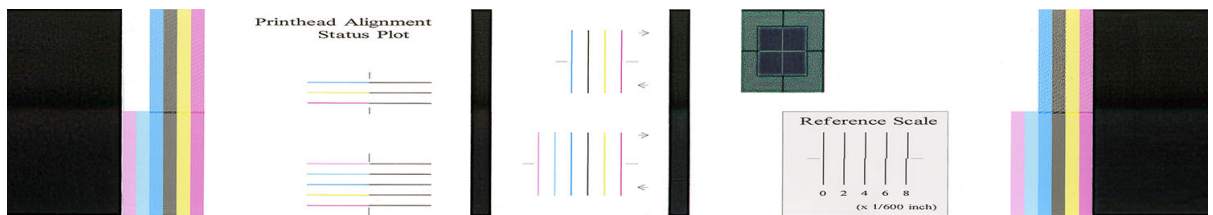
Check the continuity of the thin diagnostic lines on the alignment status plot. In one section, colored lines are printed in line with black lines to test the alignment from one color to another. In a another section, colored lines are printed such that one half is made with a forward pass and one half is made with a reverse pass to test the alignment between the two directions. In both sets of patterns, printhead misalignment will be visible as a step in the line at its center (marked with a short black line).

Printhead Alignment Status Plot
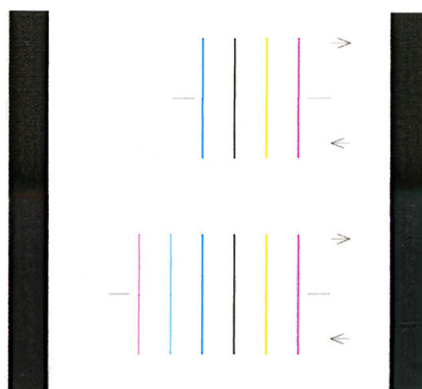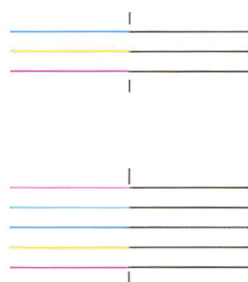
Bear in mind that small misalignments may not cause any print-quality defects. The printing process is designed to hide the effects of small amounts of misalignment. The reference scale can be used to quantify the amount of misalignment; errors below 4/600 inch are unlikely to cause print-quality defects.

The optimizer fluid is transparent and cannot usually be seen directly. The fluid can be seen on some substrates (such as self-adhesive vinyl) when printed in conjunction with the colored inks. The cross pattern that is printed above the reference scale is printed in this way and can be used to evaluate the alignment of the optimizer on some substrates. In a well-aligned system, the light-colored cross at the center of the pattern will be aligned with the four black lines at the sides of the pattern. The following figure shows how this pattern will appear on the substrates on which it is visible. This sample is slightly misaligned.

Reference Scale
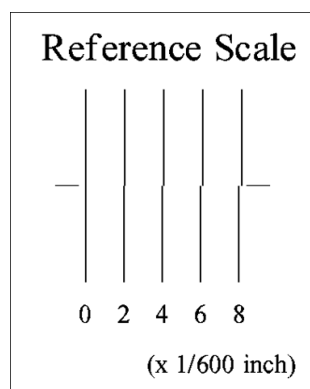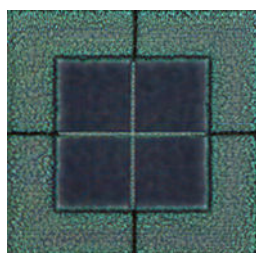
If the printheads are misaligned or you feel unsure about them—for example, because a substrate crash occurred—then align the printheads. See .

4. Substrate-advance check plot

To fine-tune the quality of your print, you may need to adjust the rate at which the substrate advances. The substrate advance determines the placement of dots on the substrate. If the substrate is not advanced correctly, light or dark bands appear in the printed image and the grain in the print may increase.

You can modify the substrate advance from the RIP or front panel with the Substrate Advance parameter in the substrate preset.

To print the substrate-advance check plot:

1. Use the same substrate type that you were using when you detected a problem.

2. Check that the selected substrate type is the same as the substrate type that is loaded into the printer.

3. Go to the front panel and press ⚙, then **Image-quality maintenance** > **Substrate advance calib** > **Print adjustment plot**.

The substrate-advance check plot consists of several columns with a number at the bottom of each one. Locate the lightest of the columns and enter its number into the Substrate Advance parameter for the current substrate preset. The value chosen in this example should be "−6".
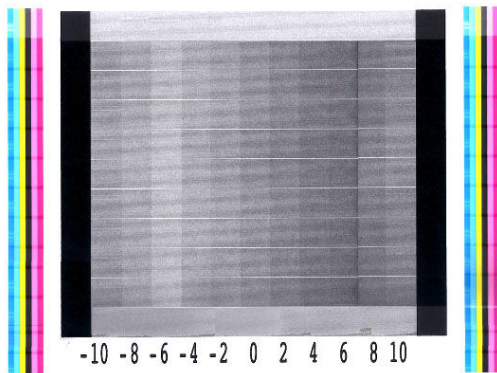
📝 **NOTE:** Minor substrate-advance problems (±2 around the 0 value) are unlikely to result in any print-quality problem, especially with print modes of more than 8 passes.

Substrate advance adjustment while printing

If you are using no more than six passes, you can fine-tune the substrate advance while printing: press

, then **Adjustments** > **Adjust substrate advance**. Select a value of change from −10 mm/m to +10 mm/m (or mils/inch). To correct light banding, decrease the value. To correct dark banding, increase the value.

If you are using eight passes or more, a wrong advance adjustment will not produce banding but graininess, which is harder to assess visually. Therefore, in this case you are recommended to use only the adjustment plot.

When you have chosen a value and pressed OK, the rest of your job will be printed with that value, but it will be reset to zero at the end of the job. Add the value found to the Substrate Advance value in the preset to print all future jobs with the new setting.

What to do if problems persist

If you still experience print-quality problems after applying the advice in this chapter, here are some additional tips to consider:

● Try selecting a higher print-quality option in your RIP software, by increasing the number of passes.

● Check that your printer firmware is up to date. See Firmware update on page 156.

● Check that you have the correct settings in your software program.

● Call your service representative. See When you need help on page 39.