

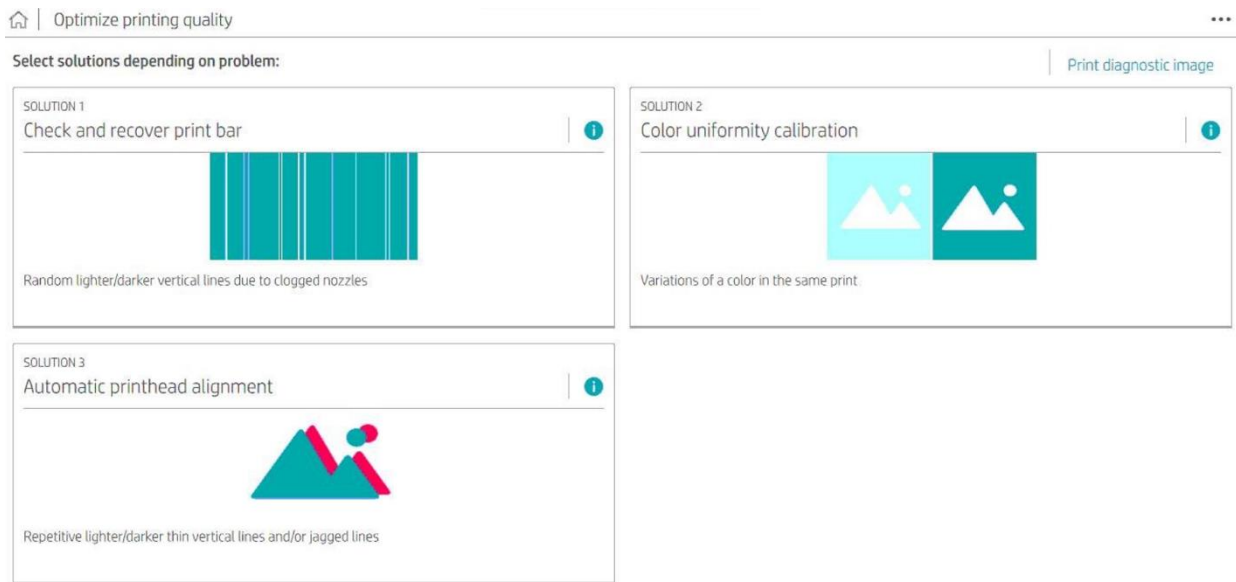
# HP PageWide XL Pro Printer series - Calibration guide



This is an overview of the image-quality calibration procedures available for the HP PageWide XL Pro Printer series. Some calibrations are highly recommended to properly set up the printer while others are only for troubleshooting issues or fine-tuning image-quality.

## Calibrations to optimize printing quality

In the **Optimize printing quality** menu on the front panel there are three calibrations available:



### Solution 1: Check and recover the print bar

*When to perform this calibration:* This calibration can be performed when there are clogged nozzles visible as white lines, or after a severe paper jam. It is also recommended after long periods without printing. This procedure might need to be repeated to achieve the best results.

*How is this calibration applied?* This calibration tries to recover any printhead nozzle that is out of action. After this calibration, all printed images, independent of the substrate type, will benefit from the recovered nozzles.

*What to expect:* This calibration usually recovers printhead nozzles, but if a printhead has been severely damaged, it might not work and some white lines may still be present. If that happens, the user can carry out advanced calibration [Enhanced printhead recovery](#) (solution 6).

### Solution 2: Color uniformity calibration

*When to perform this calibration:* This calibration should be performed when a printhead is moved or changed, a new calibratable substrate is used for the first time (e.g., HP Universal Heavyweight Coated Paper), or when there are image-quality issues such as banding or leading-edge defects.

*How is this calibration applied?* It can only be performed on HP flexible (rolls or sheets) substrates. After carrying it out, an algorithm will be applied to recalculate values for all non-calibratable substrates and calibratable substrates that have not yet been calibrated.

The following HP substrates can be calibrated:

Calibratable substrates
HP Universal Heavyweight Coated Paper
HP Gloss Poster
LHP Production Satin
HP Production Matte Polypropylene
HP Premium Bond

If a substrate cannot be calibrated, an “Equivalences Table” is available via the front panel. It shows which substrate is recommended for running the calibration. It can also be found in this document.

*What to expect:* This calibration will improve the die-to-die color bands and the leading-edge performance.

### Solution 3: Automatic printhead alignment

*When to perform this calibration:* Carry out this calibration when a printhead is moved or changed, a new calibratable substrate (such as flexible or rigid) is used for the first time, or when there are image-quality issues such as white or dark vertical lines.

*How is this calibration applied?* This calibration affects all substrates for that format, where the substrate format is flexible (roll or cut sheet < 400 gsm) or rigid (boards or cut sheet > 400 gsm).

*What to expect:* This procedure resolves most printhead alignment issues. It does not need to be repeated; if further improvements are required, the user can carry out manual alignment calibrations.

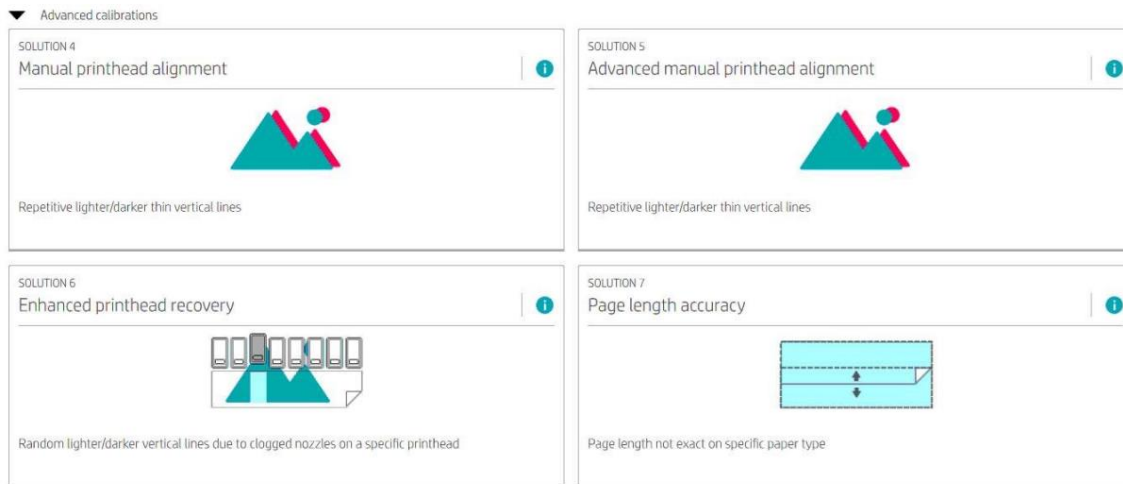
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**TIP:** In some cases, automatic printhead alignment alone may be enough to correct defects, and manual printhead alignment calibrations will not be needed because it will not make any performance improvements.

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### Advanced calibrations to optimize printing quality

If you can still see image-quality issues after performing the first three calibrations, you may need to run advanced calibrations to mitigate defects.



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**TIP:** Some defects may appear only on specific paper types. You may be able to achieve better results in some cases by changing the paper type. Sometimes coated papers show more defects while uncoated papers sometimes hide them.

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## Solution 4: Manual printhead alignment

*When to perform this calibration:* Carry out this calibration if you can still see white or dark lines between dyes after running the automatic printhead alignment.

*How is this calibration applied?* This calibration impacts all substrates for that format, where the substrate format is flexible (roll or cut sheet < 400 gsm) or rigid (boards or cut sheet > 400 gsm).

*What to expect:* This calibration resolves most printhead alignment issues still present after the automatic printhead alignment. It is an incremental calibration, but usually should not be performed more than once, if at all. If further improvements are needed, you can carry out the advanced manual printhead alignment calibration.

## Solution 5: Advanced manual printhead alignment

*When to perform this calibration:* Carry out this calibration if you can still see white or dark lines between dyes after manual printhead alignment.

*How is this calibration applied?* This calibration will only affect the substrate being used (e.g., HP Universal HWC).

*What to expect:* This calibration is the final step to improve the printhead alignment quality. It does not need to be repeated. Some substrates may show more defects than others, depending on their coating and properties. This procedure will not always improve the quality. If the image quality is already within specs after automatic and manual printhead alignment, this calibration might not make any improvement.

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**NOTE:** This calibration is an advanced procedure only recommended for expert users. Incorrectly performed, it may worsen the system's image quality. HP recommends this calibration is only carried out

to fine-tune a specific color if needed. In most cases, automatic and manual printhead alignment will provide a satisfactory solution across all colors.

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## Solution 6: Enhanced printhead recovery

*When to perform this calibration:* Carry out this calibration when some nozzles are still out of action after completing [Check and recover print bar](#) (solution 1). If the printhead is in a severe state, this may need to be repeated to achieve the best results.

*How is this calibration applied?* This calibration tries to recover the printhead nozzles that are out of action. After this calibration, all printed plots, independent of the substrate type, will benefit from the recovered nozzles.

*What to expect:* This calibration will usually recover the printhead nozzles, but if the printhead has been severely damaged, the user might have to change the printhead.

## Solution 7: Page length accuracy

*When to perform this calibration:* Carry out this calibration to correct inaccurate printed page lengths.

*How is this calibration applied?* This procedure will only impact the substrate being used (e.g., HP Universal Heavyweight Coated Paper).

*What to expect:* It can be carried out automatically or manually. If this does not solve the problem, call your service representative.

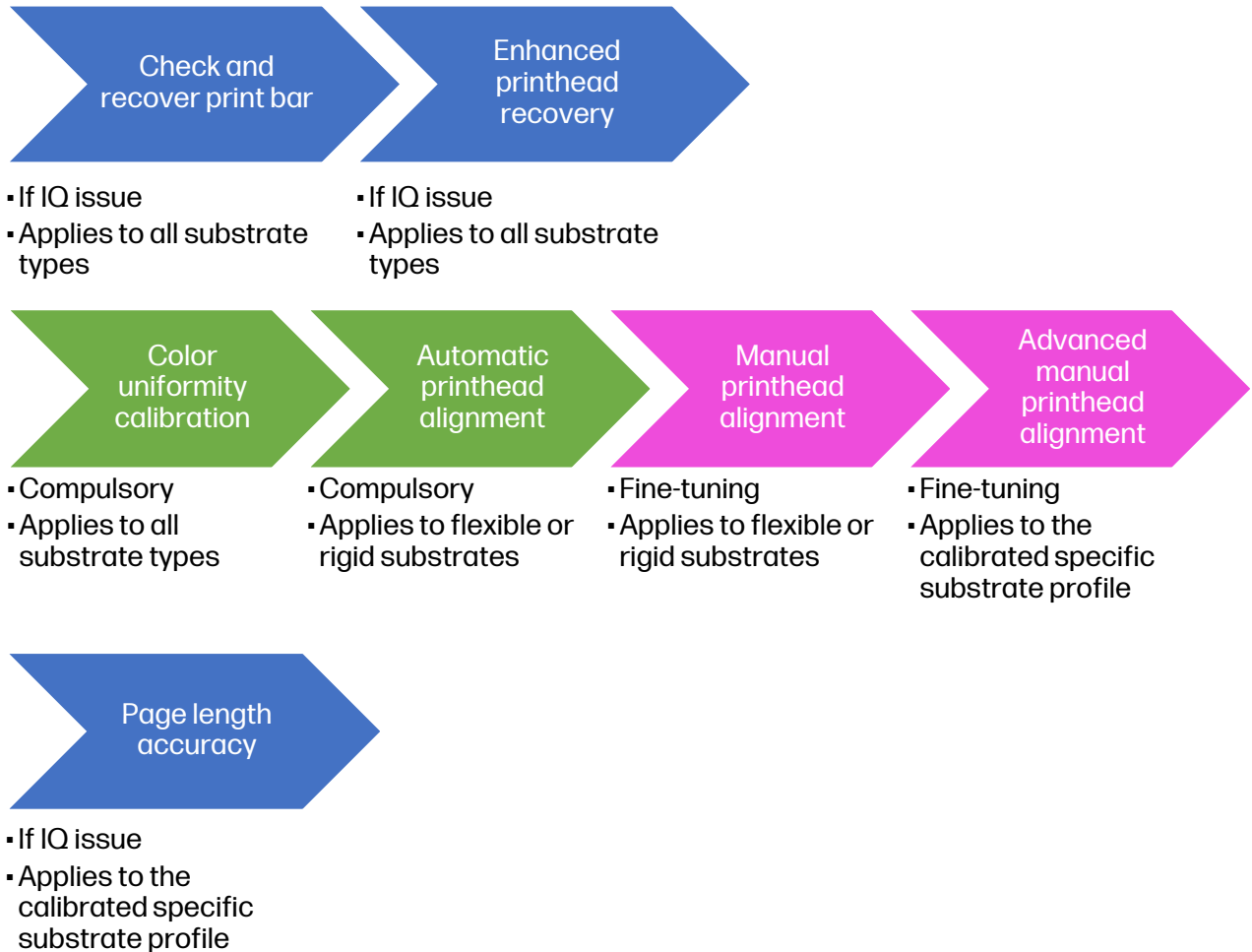
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**NOTE:** These calibrations help achieve the best image quality that the system can provide. Nevertheless, a single-pass printing technology might have residual non-uniformities across colors and substrate types, even after full calibration has been done.

After carrying out the calibrations, check the *Diagnostic image* process from the *Optimize printing quality* menu in the User Guide to troubleshoot visible image-quality defects.

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## Summary of the calibration workflow



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**NOTE:** If you need more specific information with regards to calibration procedures, check the User Guide or contact your service representative.

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## Paper equivalences for the color uniformity calibration

The following table shows, if a substrate cannot be calibrated, which substrate is recommended for running the calibration.

Calibratable substrates	Substrate equivalences
HP Universal Heavyweight Coated Paper, 3-in Core	HP Universal Heavyweight Coated Paper, 3-in Core Coated Paper (90-100gsm) Heavyweight Coated Paper (>100gsm) Plain Paper (>110gsm) Plain/Uncoated Foam Board Plain/Uncoated Paper (>400gsm) Plain/Uncoated Paper (<200gsm) Plain/Uncoated Paper (200-400gsm) Unlined Compressed Board Water Based Coated Paper (>400gsm) Water Based Coated Paper (<200gsm) Water Based Coated Paper (200-400gsm) Water Based Coated Foam Board
HP Production Satin Poster Paper, 3-in Core	HP Production Satin Poster Paper, 3-in Core HP Production Matte Poster Paper, 3-in Core Poster matte paper Poster matte paper (>400gsm) Poster matte paper (<200gsm) Poster matte paper (200-400gsm) Poster semi-gloss paper Poster satin paper
HP Production Satin Poster Paper, 3-in Core	HP Production Satin Poster Paper, 3-in Core HP Production Matte Poster Paper, 3-in Core Poster matte paper Poster matte paper (>400gsm) Poster matte paper (<200gsm) Poster matte paper (200-400gsm) Poster semi-gloss paper Poster satin paper
HP Gloss Poster Paper, 3-in Core	HP Gloss Poster Paper, 3-in Core Poster gloss paper
HP Production Matte Polypropylene, 3-in Core	HP Production Matte Polypropylene, 3-in Core Mohawk wide format inkjet DuPont Tyvek PET Polypropylene Banner with DuPont Tyvek
HP Premium Bond Paper, 3-in Core	HP Premium Bond Paper, 3-in Core

## Calibration summary

### Color uniformity and printhead alignment calibrations

The following table is a summary of the color uniformity and printhead alignment calibrations.

Calibration	What is it?	When should it be performed?	Does it need to be repeated?
<b>Color Uniformity Calibration</b>	This calibration will improve the dye-to-dye color bands and leading-edge performance.	To ensure good image-quality.  It must be performed when: <ul style="list-style-type: none"> <li>• changing or moving a printhead</li> <li>• using a calibratable substrate for the first time</li> <li>• there are image-quality issues such as leading-edge or banding defects</li> </ul>	No, it is not an incremental calibration.  Under normal circumstances, this calibration should be performed only once.
<b>Automatic Printhead Alignment</b>	This calibration will resolve most printhead alignment issues.	To ensure good image-quality.  It must be performed when: <ul style="list-style-type: none"> <li>• changing or moving a printhead</li> <li>• using a new substrate format (e.g., flexible, or rigid)</li> <li>• there are image-quality issues such as vertical white or dark lines</li> </ul>	No, it is not an incremental calibration.  Under normal conditions, this calibration should be performed only once.
<b>Manual Printhead Alignment</b>	This calibration will resolve most printhead alignment issues that exist after the automatic printhead alignment.	After running the automatic printhead alignment, if there are still visible white/dark lines between dyes.	It is an incremental calibration  Under normal conditions, it should not be performed more than once, or not executed at all.
<b>Advanced Manual Printhead Alignment</b>	This calibration is the final step to improve the printhead alignment quality, to fine-tune specific primary colors.  If, after automatic or manual printhead alignment, the image-quality is already within specs. this calibration might not add any improvement.	This calibration can be performed if there are still visible white/dark lines after running the manual printhead alignment.  It is recommended for advanced users, and only if there are still areas where minor corrections occur.	No, it is not an incremental calibration.  Under normal conditions, this calibration should be performed only once.

The following table shows how the calibrations are applied across flexible and rigid substrates formats:

Substrate format Calibration	Flexible		Rigid	
	Roll	Cut Sheet (< 400 gsm)	Cut Sheet (> 400 gsm)	Board
<b>Color Uniformity Calibration</b>	Doable on calibratable roll material.	Algorithm applied to recalculate values for non-calibratable materials, including custom substrates.		
<b>Automatic Printhead Alignment</b>	Doable on any roll or cut sheet <400 gsm substrates, even custom. Will impact all substrate of this format.		Doable on any cut sheet > 400 gsm or board substrates, even custom. Will impact all substrate of this format.	
<b>Manual Printhead Alignment</b>	Doable on any roll or cut sheet <400 gsm substrates, even custom. Will impact all substrate of this format.		Doable on any roll or cut sheet > 400 gsm substrates, even custom. Will impact all substrate of this format.	
<b>Advanced Manual Printhead Alignment</b>	Doable on any roll substrate, even custom. Will impact only the media preset being used.	Doable on any cut sheet < 400 gsm substrate, even custom. Will impact only the media preset being used.	Doable on any cut sheet > 400 gsm substrate, even custom. Will impact only the media preset being used.	Doable on any board substrate, even custom. Will impact only the media p reset being used.

How do calibrations apply if a previous calibration has been performed?



- Printhead alignment:
    - The new calibration is applied to all substrates of the same format, rigid or flexible, even custom substrates
    - Manual printhead alignment and advanced manual printhead alignment of the same format will be reset
  - Color uniformity calibration:
    - The calibratable substrates that have already been calibrated will keep their calibrated values
    - The new calibration will be used for:
      - The recently calibrated substrate
- And, after applying an algorithm to recalculate values, it will be used for:
- Calibratable substrates which have not yet been calibrated
  - All non-calibratable substrates, even custom substrates

When do printhead alignment and color calibrations reset and need to be performed again?

- When calibrations are reset via the front panel
- When a printhead is moved, replaced, or removed and inserted in the same place again

What to do if after performing the calibrations there are still image-quality defects:

To troubleshoot visible image-quality defects check the *Diagnostic image* process from the *Optimize printing quality* menu, in the User Guide.

## Recovery and page length calibrations

Calibration	What is it?	When to perform it?	Does it need repetition?
<b>Check and recover print bar</b>	<p>This calibration tries to recover the nozzles that are out of action on the printheads.</p> <p>It is independent of the substrate being used.</p>	<p>When there is some presence of clogged nozzles visible such as white lines, or after a severe paper jam.</p> <p>Also recommended after long periods of inactivity.</p>	Some repetition might be needed
<b>Enhanced printhead recovery</b>	<p>This calibration tries to recover the nozzles of a specific printhead that are out of action.</p> <p>It is a more in-depth recovery than the check and recover calibration, and it is also independent of the substrate being used.</p>	When some nozzles are still out of action after the check and recover print bar.	<p>Some repetition might be needed, if the printhead health status is severe.</p> <p>If the printhead has been severely damaged, the user might decide to change the printhead.</p>
<b>Page length accuracy</b>	<p>This calibration adjusts the page length.</p> <p>This calibration will impact only the substrate being used.</p>	If printed page lengths are incorrect.	No.