

# Cookbook – Color-matching between HP Latex 1500 and HP Latex 500 printers



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# Table of contents

Table of contents.....	2
<b>1 Overview.....</b>	<b>3</b>
Those who will benefit from reading this document.....	3
Process.....	4
<b>2 Terminology and considerations.....</b>	<b>5</b>
Master and secondary.....	5
Profiling.....	5
Fine-tuning the substrate preset on the Latex 5X0.....	5
Color emulation in the RIP.....	6
<b>3 Step-by-step process.....</b>	<b>7</b>
1. Set-up both printers.....	7
2. Create the color reference on the production printer.....	7
3. Export the calibrated substrate preset from production printer.....	8
4. Create an ICC profile for the production printer.....	9
5. Import the substrate preset from the production printer to HP Latex 5X0.....	9
6. Fine-tune the substrate preset on the Latex 5X0.....	10
7. Color-calibrate on the Latex 500.....	11
8. Create the matching ICC profile for the Latex 500.....	12
<b>4 Useful links.....</b>	<b>13</b>
Product documentation.....	13
User manuals.....	13
Further information.....	13

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# 1 Overview

HP Latex 500 Series printers offer the ability to achieve output that matches the color reproduction of other “Generation 3” HP Latex printers, enabling the use of a HP Latex 500 printer as a “proofer” (or “sample printer”) for a production device like the HP Latex 1500 or an HP Latex 3000 Series printer.

This document explains the process, step-by-step, of setting up a Latex 500 to achieve the best color-match with the production printer by using the Latex 500’s “color emulation” feature and creating new ICC profiles for both printers.

## Those who will benefit from reading this document

This document is intended for:

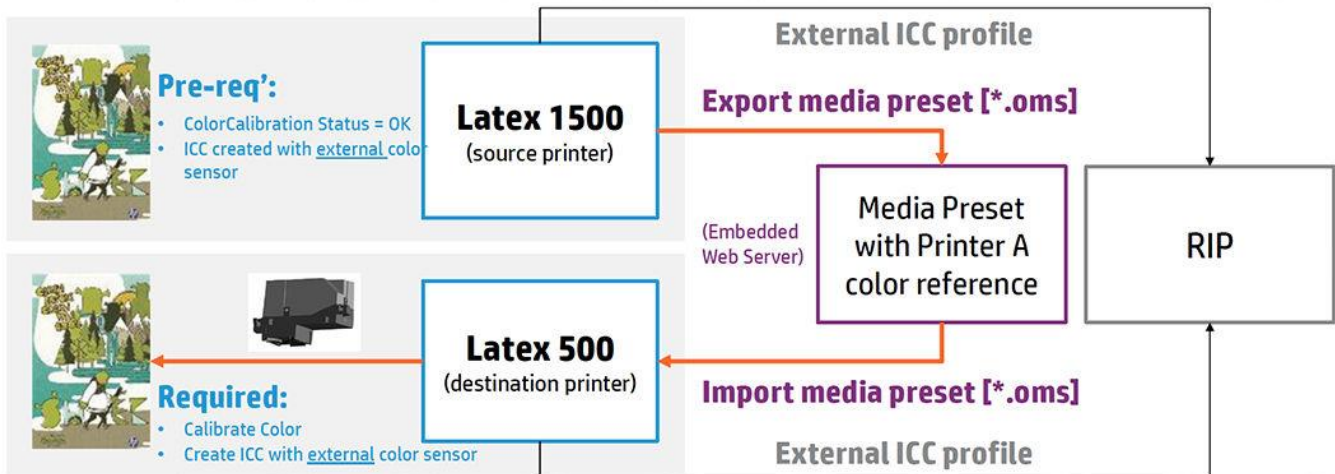
- Owners and operators of HP Latex 1500 (or 3X00) production printers who wish to use an HP Latex 500 Series printer to produce samples or “proofs” with color that matches that of their production printer when printing on the same substrate.

Requirements to complete this process:

- A production HP Latex printer (HP Latex 1500 or 3X00) and an HP Latex 500 Series printer.
- A substrate compatible with both printers, for which color calibration is supported.
- A RIP software capable of creating an ICC profile
- A suitable color measurement device (spectrophotometer)

## Process

In this process, the production printer (Latex 1500 or Latex 3X00) is referred to as the “master” and the Latex 500 is then set up to match the color reproduction of the master printer, through a three-step process:



1. Set up the substrate on the “master” printer and perform a color calibration. Export the substrate preset.
2. Import the substrate preset from the master printer to the 500 Series printer, fine-tune the preset and then perform a color calibration with the 500 Series printer.
3. The 500-Series printer will then create a matching version of the substrate from the master, with a print mode that has characteristics matching that of the master printer. The color calibration in the proofer will use the measured color values from the master as a reference.
4. Create a new ICC profile in the RIP for **both** printers using the **same** process, settings and color measurement device to ensure maximum consistency between the two printers.
5. **Optionally:** Use the “color emulation” feature in the RIP to optimize the reproduction of out-of-gamut colors.

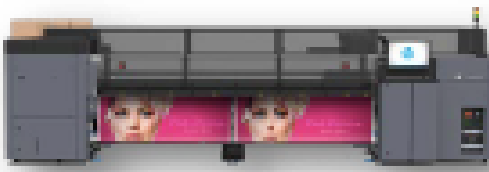
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## 2 Terminology and considerations

### Master and secondary

The production device is always considered to be the “master” printer in terms of color, and the Latex 5X0 is considered to be the “secondary” printer, or proofer. This is because, out of the models available in the range of HP Latex printers, only the HP Latex 5X0 has the “color emulation” feature that allows it to color-match with another model.

Secondly, any trade-offs in terms of performance that may otherwise be needed in order to achieve good color-matching is only imposed on the smaller, lower-productivity device (the Latex 5X0 in this case), and this is to ensure that the main production volume can be run without any trade-offs in throughput.



HP Latex 3000 Series: **Master**



HP Latex 500 Series: **Secondary**

### Profiling

As stated above, in order to achieve the best possible color-matching between the two printers, it is necessary to make **two new ICC profiles**—one for each printer. This is because, in general, the process used to create a given ICC profile (i.e. which RIP, settings and spectrophotometer used) is not known, and the best color-matching can only be achieved when the two ICC profiles are made in exactly the **same way** (with the same substrate, RIP, RIP and printer settings and spectrophotometer).

### Fine-tuning the substrate preset on the Latex 5X0

In the second step, it may be necessary to do some fine-tuning of the substrate settings in the secondary printer. The color-emulation process on the Latex 5X0 takes a substrate preset exported from the production device and creates an equivalent substrate preset with a print mode that:

- Matches the print quality of the print mode in the production printer (but with a different number of passes)
- Can print the same range of colors (gamut) of the production printer’s mode (there may be a different ink density)
- Has a copy of the color reference from the production printer

However, the remaining parameters (level of optimizer, mechanical settings, curing settings) operate differently between the two families of printers in that some are present only in one family or they have different units or minimum and maximum values.

In fact, they are set to the default values for the substrate in the Latex 5X0 family and may need to be fine-tuned for best results.

## Color emulation in the RIP

There is a final, optional step, which is to use the RIP's color emulation feature to further improve the **color-matching between the two printers** for colors that are not accurately reproducible on one or both printers.

**NOTE:** Not all software RIPs have this feature, and the exact details of how it is used vary from one RIP to another, so please see the documentation specific to your RIP for further details.

After having completed the basic process outlined above (the first three steps), the Latex 500 should be able to reproduce all the colors that the production device can reproduce, plus a few extra colors that are not printable by the production device.

Therefore, in regards to how the two printers will reproduce a given target color, there are three possible situations:

1. In-gamut on both devices: The desired color can be reproduced on both devices.
2. In-gamut (reproducible) on the proofer but out-of-gamut (not reproducible) on the production device.
3. Out-of-gamut (not reproducible) on either printer.

In case 1 above, the two printers will produce the same color without any additional work, so color emulation in the RIP is not necessary.

Color emulation in the RIP helps in the cases 2 and 3 above by limiting the range of colors printed on the proofer (which can print a wider range of colors than the production printer can) to the colors that are printable by the production printer, hence a closer color-match is achieved between the two.

# 3 Step-by-step process

## 1. Set-up both printers

Make sure that the printheads are in good working condition and that the basic calibrations have been done on both printers using the same substrate (the substrate that you wish to achieve color-matched prints on).

- Printhead check-and-clean.
- Printhead alignment.
- Substrate-advance calibration (if needed).



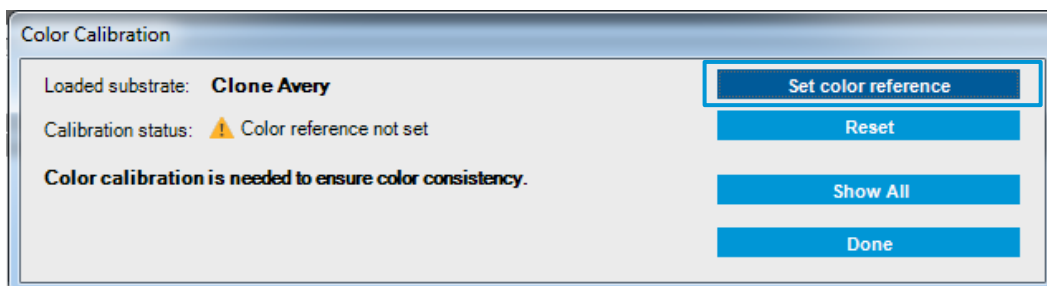
### Further reading:

Please refer to the printer's [User Guide](#) for an extended explanation on **How to handle the substrate** and **Substrate settings**.

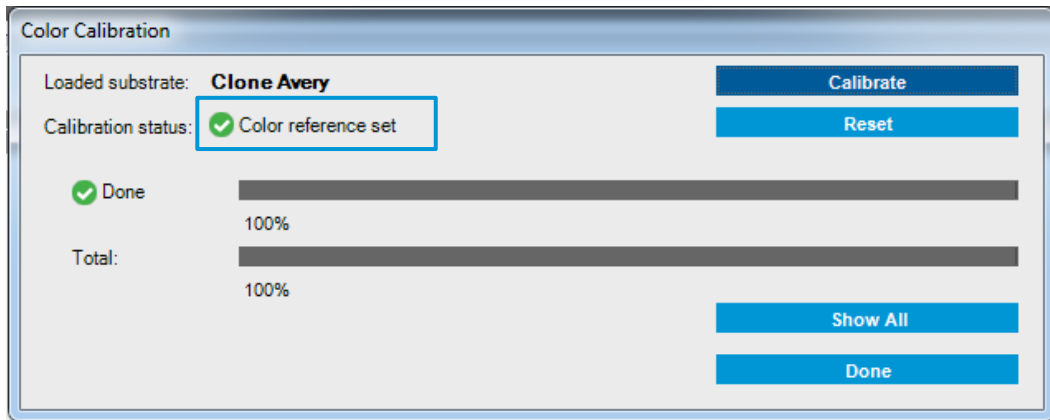
## 2. Create the color reference on the production printer

In the IPS of the production printer, select **Substrate > Color Calibration**, to show the color calibration status of the substrate.

- If the substrate has never been color-calibrated, choose the first option, which is (as shown below): **“Set color reference”**.
- If it *has* been calibrated in the past, the first option will read **“Calibrate.”** In this case, in order to avoid any doubts about the validity of the calibration, the recommended action is to delete any existing calibration (by selecting **“Reset”**) and then choose the first option, which will have changed back to **“Set color reference.”**
  - Click on **“Set color reference”** to perform the color calibration and to set the color reference.



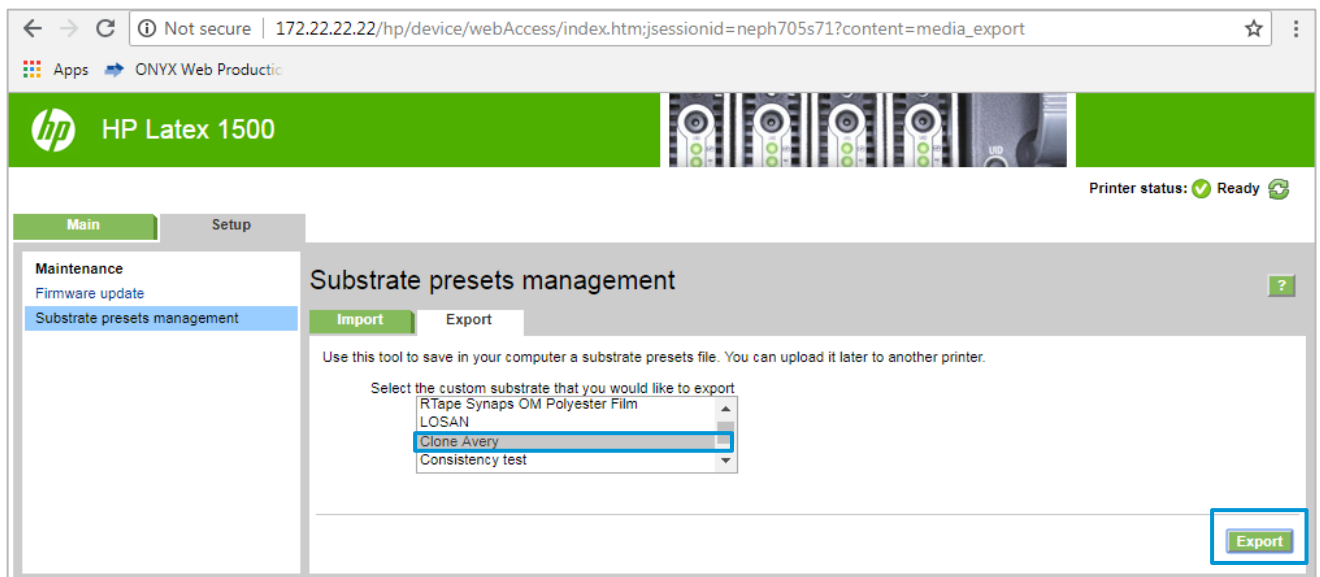
- When complete, the substrate's calibration status will change to "Color reference set," as shown below.



- Now the substrate preset in the production printer is ready to be exported.

### 3. Export the calibrated substrate preset from production printer

- Go to **Substrate > Presets Management**.
- Select the substrate that you color-calibrated, then click "Export" to export the substrate preset. It will be saved as a file with a name like "paperpreset.oms," which **should be re-named** to a name matching the substrate type to avoid any confusion.



Above: Exporting the calibrated preset from the production printer



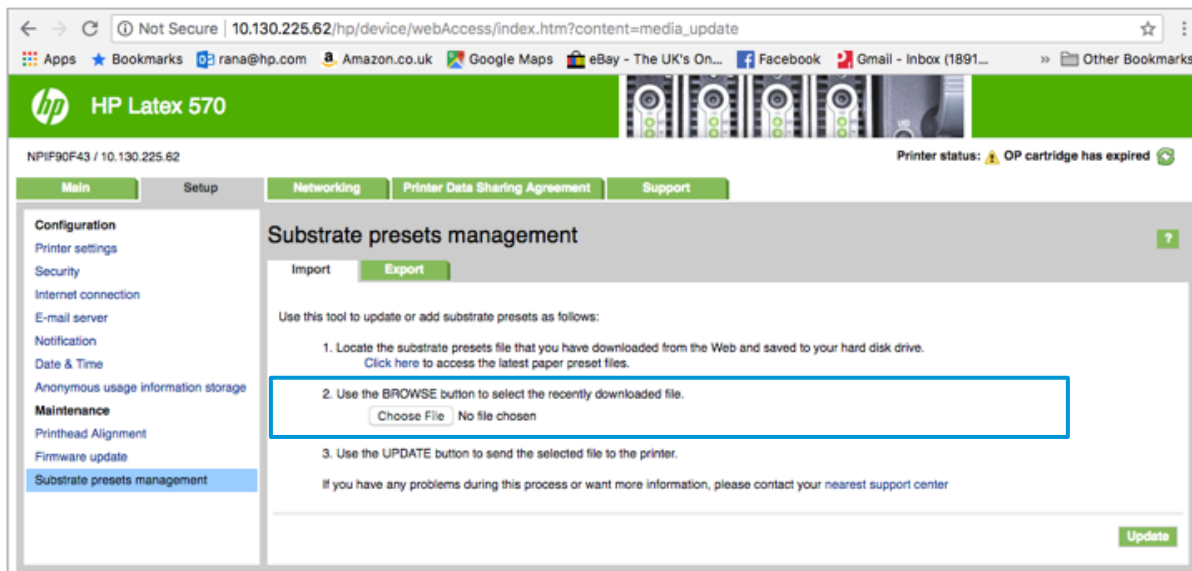
## 4. Create an ICC profile for the production printer

In most cases, the ICC profile for the production printer will already exist, but it will not be known exactly how that ICC was created in terms of the RIP, the RIP's settings and the spectrophotometer that was used.

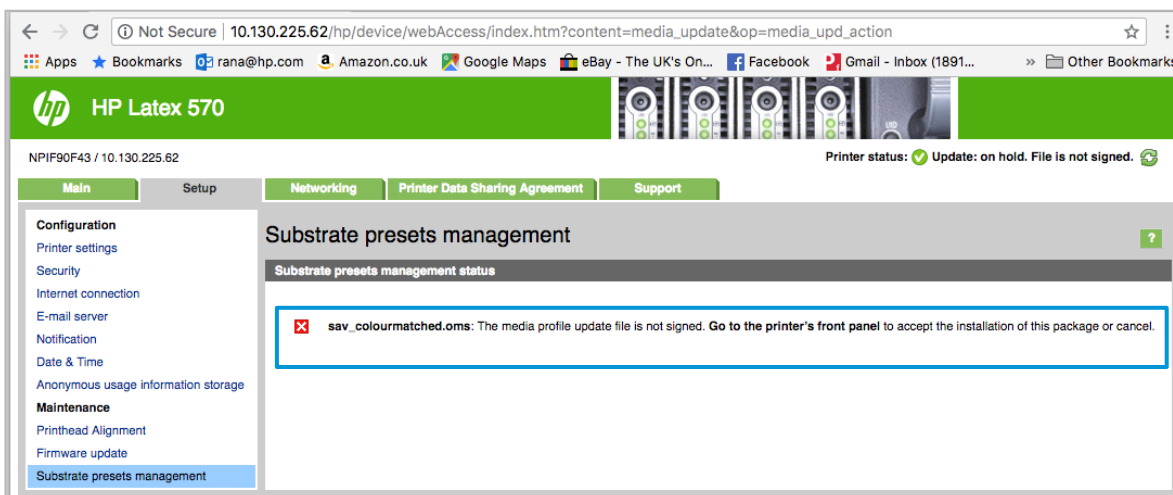
In order to get the best possible color-match between the two printers, it is critical that both have ICC profiles made in exactly the same way (the same RIP, RIP settings and spectrophotometer), so it is recommended that a new ICC profile be created for the production printer at this point, using the substrate you have calibrated.

## 5. Import the substrate preset from the production printer to HP Latex 5X0

- On the Latex 5X0 printer, open the **Embedded Web Server**.
- Navigate to the **“Setup”** tab, then select **“Substrate presets management”** from the left-hand menu. Then select the substrate preset that you exported from the Latex 1500 in **step 3** above.



- If you see a warning that the preset is not signed (as in the screenshot below), go to the printer's front-panel and click **Continue** to import the preset.



- The Web Server will show the message “Installing substrate preset.”
- The imported substrate will now appear in the list of known substrates on the Latex 5X0, with the same name as the original substrate in the Latex 1500, but with “-emulated” added to the name.

## 6. Fine-tune the substrate preset on the Latex 5X0

The newly-created substrate preset on the Latex 5X0 will have the same number of printmodes defined as the original preset in the Latex 1500, but a different number of passes and ink density will be in effect, these having been set by the Latex 5X0 to produce a similar image quality and color gamut to those produced by the original print modes on the Latex 1500.

In the example, a print mode from the Latex 1500 using 4 passes, 6 colors and a 90% ink density is translated into a print mode of 8 passes, 6-colors and a 90% ink density on the Latex 500.

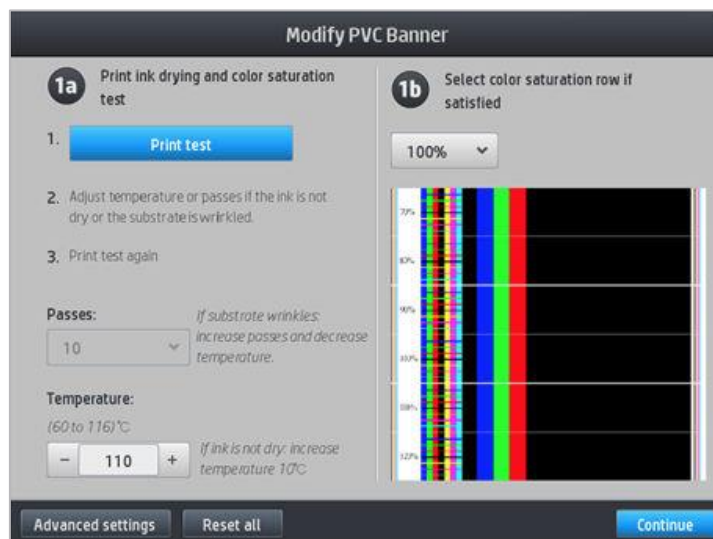
The emulation process on the Latex 500 sets the number of passes, number of colors and ink density automatically, since some of the other parameters differ between the two printer families (some parameters exist for only the production devices, and others may have different units or limits due to the hardware differences between the printers).

The Latex 500 has built-in test prints available to help set the correct curing parameters and amount of optimizer.



### Further reading:

See “[Modify a substrate preset](#)” in Chapter 4 of the Latex 5X0 [User Guide](#) for further details of the parameters, limits and test prints available from the printer’s front panel, as shown below.



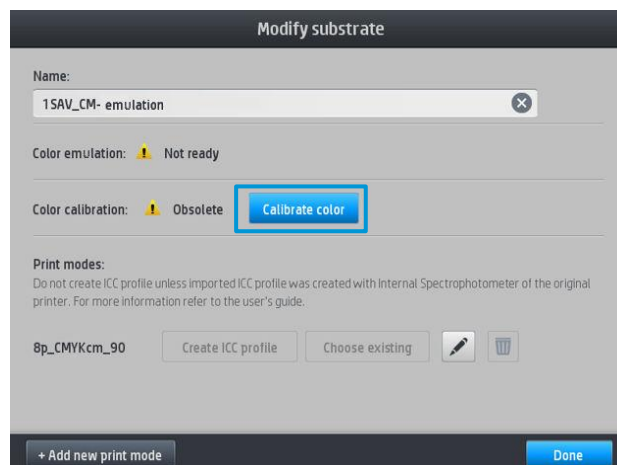
Latex 5X0: Test print for curing parameters



Above: Latex 5X0 test-print for optimizer level

## 7. Color-calibrate on the Latex 500

- Once the substrate parameters have been fine-tuned you can run the color calibration on the Latex 5X0, which will use the color reference exported from the Latex 1500 as a target, which allows the colors of the Latex 1500 to be matched by the Latex 5X0.
- Select the newly-imported substrate, then select **“Modify”**. The color emulation status is shown as **“Not Ready”**. Start the color calibration process by clicking **“Calibrate color,”** as shown below.



- After a successful color calibration, the color calibration status changes to **OK** and the color emulation status changes to **Ready**.

## 8. Create the matching ICC profile for the Latex 500

As explained above, the ICC profiles for each printer should be made in exactly the same way for the best color-matching.

Here, a new ICC profile for the Latex 500 on the emulated substrate should be created, using the same RIP, RIP settings and spectrophotometer used to create the ICC profile on the production printer.

Once these matching ICC profiles are created for the two printers, it should only be necessary to repeat the color calibrations on both printers on a regular basis in order to maintain the color-matching between the two printers.

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# 4 Useful links

## Product documentation

- <http://www.hp.com/go/latex1500>
- <http://www.hp.com/go/latex560>
- <http://www.hp.com/go/latex570>

## User manuals

- <http://www.hp.com/go/latex1500/manuals/>
- <http://www.hp.com/go/latex560/manuals/>
- <http://www.hp.com/go/latex570/manuals/>

## Further information

- <https://hpllatexknowledgecenter.com>