





# Printing vehicle graphics with HP Latex Printing Technologies

## The printing process

Printing with HP Latex Printing Technologies is user-friendly and intuitive. HP has worked to simplify the process and therefore offers printer settings and ICC profiles to download from the Media Solutions Locator: [hp.com/go/mediasolutionslocator](http://hp.com/go/mediasolutionslocator).

It is important to know that no self-adhesive vinyl is the same: they all require their own, customized settings. Therefore, HP recommends accessing the Media Solutions Locator to download settings for available media. If the self-adhesive vinyl that you want to use is not available on the Media Solutions Locator, see the “Add a new substrate guide” for your HP Latex Printer.

HP Latex 200 series printers and HP Latex 800 series printers follow different processes when printing. Please see over for instructions on how to print with HP Latex 800 series printers and HP Latex 200 series printers.

## Handling self-adhesive vinyl

Self-adhesive vinyl is a sensitive material that must be handled with care for optimal results. To achieve excellent results with HP Latex Printing Technologies, HP recommends the following:

- 1. Store vinyl in an upright position and not directly on the ground:** Always store self-adhesive vinyl in an upright position; the increased pressure from lying down horizontally can change the structure of the vinyl and have an impact on print results. Vinyl should not be stored directly on the ground to avoid the risk of moisture damaging the substrate.
- 2. Wear gloves:** Always wear gloves when handling self-adhesive vinyl before printing. The oil from hands can transfer to the self-adhesive vinyl surface and impact the print quality.
- 3. Room temperature:** The behavior of vinyl is significantly influenced by temperature and should neither be too hot nor too cold. When vinyl is hot, it becomes very soft, stretches easily, and the adhesive becomes very aggressive. When vinyl is cold, it becomes brittle, tears, and does not adhere. Make it a habit to give vinyl time to adjust to the room temperature before printing and preferably store it as close to the printer as possible. See below table for temperature and humidity specifications.
- 4. Humidity:** Extremely high/low humidity can affect behavior of media and/or printhead reliability. See below table for temperature and humidity specifications.

### Printers referred to in this document:

<b>HP Latex 200 series:</b>	HP Designjet 25500 Printer
	HP Latex 260 Printer (formerly the HP Designjet L26500 Printer series)
	HP Latex 280 Printer (formerly the HP Designjet L28500 Printer series)
<b>HP Latex 800 series:</b>	HP Designjet L65500 Printer
	HP Latex 600 Printer (formerly the HP Scitex LX600 Industrial Printer)
	HP Scitex LX800 Industrial Printer
	HP Latex 820 Printer (formerly the HP Scitex LX820 Industrial Printer)
	HP Latex 850 Printer (formerly the HP Scitex LX850 Industrial Printer)



### Printer environment specifications

	Temperature Range	Humidity Range	Temperature Gradient
<b>Operating for optimal print quality</b>	20 to 25°C (68 to 77°F)	40 to 60% Relative Humidity	10°C/h (50°F/h) or less
<b>Operating for standard printing</b>	15 to 30°C (59 to 86°F)	20 to 70% Relative Humidity	10°C/h (50°F/h) or less
<b>Not operating (in transport or storage), ink in tubes</b>	5 to 55°C (41 to 131°F)	90% Relative Humidity at 55°C (131°F)	10°C/h (50°F/h) or less
<b>Not operating (in transport or storage), no ink in tubes</b>	-25 to 55°C (-13 to 131°F)	90% Relative Humidity at 55°C (131°F)	10°C/h (50°F/h) or less

### Preparation before printing a larger job

#### Parent substrates

There are three different types of parent substrates listed in the “Internal Print Server” (HP Latex 800 series printers) or in the “RIP Interface” (HP Latex 200 series printers) related to printing vehicle graphics.

#### HP Latex 200 series printers parent substrates and ink levels:

1. Vinyl – Calendered – Normal, High
2. Vinyl – Cast – Normal, High
3. Perforated Vinyl/Punch Window – Normal, High Ink

#### HP Latex 800 series printers parent substrates and ink densities:

4. Vinyl – Calendered – 100%, 150%, 250%
5. Vinyl – Cast – 100%, 150%, 250%
6. Perforated Vinyl/Punch Window – 100%, 150%, 250%.

Before a larger print job, or after not printing for a long period of time, HP recommends performing an:

#### 1. Automatic printhead cleaning.

When a printer has been left standing for longer periods of time, dried ink may clog the nozzles, which affects image quality. This is easily removed with automatic printhead cleaning.

#### 2. Automatic printhead alignment

Precise alignment between printheads is essential for color accuracy, smooth color transitions, and sharp edges in graphical elements.

**Note:** When printing with the dual-roll feature, always do a printhead alignment with single-roll set-up prior.

**Note:** Manual printhead alignment may be required when printing perforated self-adhesive vinyl, since this media does not reflect enough light to be properly read.

#### 3. Color calibration

The purpose of a color calibration is to produce consistent colors with the specific printheads, inks, and substrate that you are using, and in your particular environmental conditions. After color calibration, you can expect to get identical prints from your printer on different occasions.

**Note:** Color calibration on perforated vinyl is not supported. HP recommends downloading the HP One-view Perforated Adhesive Window Vinyl profile from the Media Solutions Locator as a starting point, then fine-tuning ink settings in terms of printout image quality.



## The printing process: Printing with HP Latex 800 series printers



### HP recommended print modes

HP Latex 800 series printers: 6 pass bidirectional or 8-pass unidirectional. 100% ink coverage.

1. Load the media
2. Access Media Solutions Locator to download media settings and color profiles
3. Print

#### 1. Loading of the self-adhesive vinyl:

- a. In the Internal Print Server on the HP Latex 800 series printers go to: Substrate > Load/Unload.
- b. Keep the media smooth and taut and make sure that there are no wrinkles.
- c. Avoid telescoping on the input roll.
- d. Make sure that the position of the media in the input and output is well aligned. If necessary, unload and reload the media.

**Note:** If you have an unexpected problem at any stage of the substrate loading process, see the Maintenance and Troubleshooting Guide for your corresponding printer model.

#### 2. Example of downloaded media settings and color profiles:

Access the Media Solutions Locator website and download the printing presets (an OMS file) that must be imported into your printer. Also download the .ICC file that must be imported into your RIP.

#### Downloaded printer settings from the Media Solutions Locator

<b>ICC Profile</b>	ftp://ftp.hp.com/pub/scitex/LX820_LX850/hp_lx820-lx850_hp_air_release_adhesive_gloss_cast_vinyl.zip
<b>Load as:</b>	[Self adhesive] Vinyl - Cast - 100%
<b>Print Mode:</b>	6 passes bidi
<b>Input Tension:</b>	45N/m
<b>Output Tension:</b>	30N/m
<b>Vacuum:</b>	20mmH2O
<b>Airflow:</b>	80%
<b>Drying Temperature:</b>	60°C (140°F)
<b>Curing Temperature:</b>	100°C (212°F)

**Note:** For the HP Designjet L65500 Printer series, the HP Latex 600 Printer and the HP Scitex LX800 Industrial Printer, printer settings (instead of an OMS file) are downloaded that must be entered into your printer.



**3. Create a new substrate type**

Import the printer presets into your printer by using the IPS. Click on Substrate Presets Management and import your saved .OMS file. Once the file has been imported, the printer automatically creates a new substrate type stored under the “customs category”. All settings are automatically specified for every print mode.

**Note:** For the HP Designjet L65500 Printer, the HP Latex 600 Printer and the HP Scitex LX800 Industrial Printer, simply copy the printer settings into the corresponding IPS column.

**4. Color Calibration**

Click on Substrate / Settings / Color / Print Plot to perform an automatic color calibration. This modifies the ink restriction values.

**Color calibration of calendered self-adhesive vinyl on the HP Latex 850 Printer**

**5. Import the .ICC file into your RIP**

Please refer to HP manual “import substrate presets into your system” or consult directly with your RIP provider.

**6. Specify print mode and substrate and send this job to the Internal Print Server**

Do this in your RIP.

**7. Open the RIP file in the IPS**

Go to “add new job icon” and open the file.

**8. You are now ready to start printing**

If your media is not listed on the Media Solutions Locator, identify a similar type of media on the Media Solutions Locator and download the settings. You can then use the settings of this media as a basic starting point, then fine-tune them following the instructions in the “Add a new substrate guide” to achieve optimal results.

**Edit substrate**

Settings > Color

**Vinyl Calendered Stk T**  
Created from: Vinyl-Calendered-100% (Self adhesive)

Adjust the color settings for this substrate:  
ink restrictions plot

Print the ink restrictions plot to help you adjust the appropriate percentages below. Color calibration will be done automatically while printing the plot.

**Ink restriction values**

Adjust the ink restriction percentages.

Yellow: 00	Magenta: 00	Light magenta: 00
Cyan: 00	Black: 00	Light cyan: 00

Buttons: Help, Previous, Finish, Reset, Print plot

**Ink restrictions**

A way of specifying the maximum amount of each color of ink that can be laid down on the substrate.

## The printing process: printing with HP Latex 200 series printers



### HP recommended print modes

HP Latex 200 series printers: 10 pass bidirectional. Normal ink setting.

#### 1. Load the Media

- a. At the printer's front panel, select the icon , then select Substrate load > Load roll.
- b. Alternatively, feed paper into the printer until the printer grasps it. The front panel will guide you through the following steps.
- c. Carefully insert the leading edge of the substrate above the black-ribbed roller, making sure the substrate remains taut during the process. Avoid pulling excess substrate from the roll, which could cause skew. Also avoid rewinding the substrate manually unless the printer asks you to do so.
- d. If substrate is smaller than printer width, it's better to locate the substrate to the left-most position in the spindle so it is centered in the print zone.
- e. The printer beeps when it detects and accepts the leading edge of the substrate.
- f. Select the correct substrate category for the roll of self-adhesive vinyl that you are loading.
- g. The printer checks the substrate in various ways and may ask you to

correct problems with skew or tension. Wait until the substrate emerges from the printer. The printer calibrates the substrate advance itself.

- h. **Note:** If you have an unexpected problem at any stage of the substrate loading process, see the Maintenance and Troubleshooting Guide for your corresponding printer model.

#### 2. Download media settings and color profiles:

Access the Media Solutions Locator website and download the printing presets and color profiles that must be imported into your printer.

If you cannot find the profiles for your substrate on the Media Solutions Locator, check availability with your RIP vendor or substrate supplier.

Use the Media Solutions Locator to download the printing presets and color profiles to import into your printer (see below).

#### 3. Install the media profiles on your RIP.

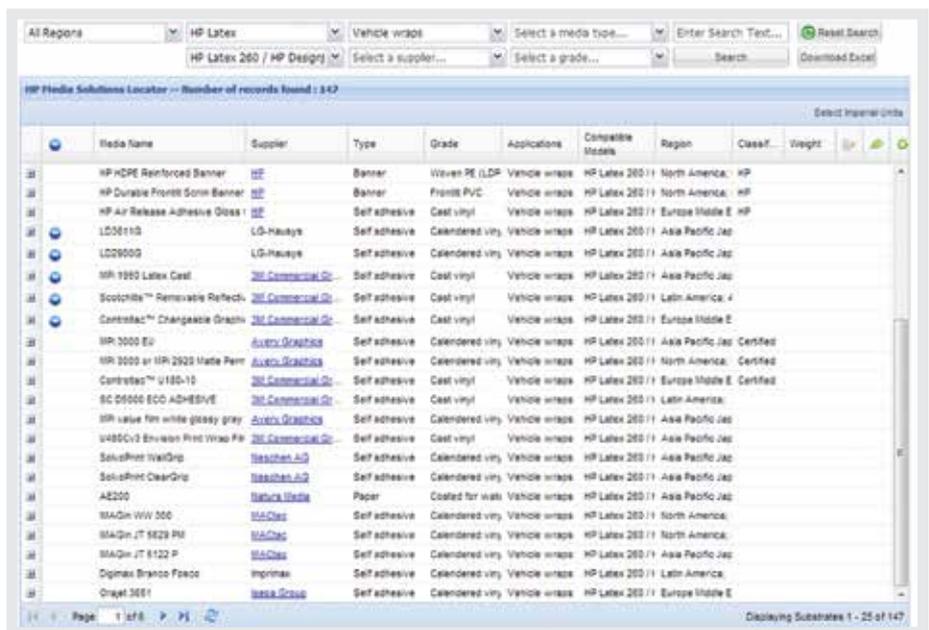
Follow RIP instructions on how to proceed.

#### 4. The printer will indicate that you are ready to start printing.

### Recommended default settings in the HP Latex 200 series printers for parent substrate "self-adhesive vinyl"

Substrate family	Self-adhesive vinyl
Drying temp	55°C (131°F)
Curing temp*	110°C (230°F)
Heating airflow	30
Auto-tracking (OMAS)	•
Cutter	•
Substrate-advance compensation	0
Input tension	15
Vacuum	25

### Media Solutions Locator showing available HP printing materials for printing self-adhesive vinyl for vehicle graphics with HP Latex 260 Printer





## Print settings

### Print Modes

The substrate type “Self-adhesive vinyl Calendered 100%” includes 2, 3, 4, 5, 6, and 8 passes.

### Number of Passes

Specifies how many times the printheads print over the same area of the surface. The higher the number of passes, the higher the print quality and color vibrancy, however print speed is lower. HP recommends changing the number of passes by one step at a time.

**Note:** Print modes with less than 6 passes are printed unidirectional for higher speed.

### Curing Temperature

Curing is needed to coalesce the latex particles, creating a polymeric film which acts as a protective layer, while at the same time removing the remaining liquid from the print. Curing is vital to ensure the durability of the printed image.

HP recommends changing temperature in steps of 5°C (41°F) as many times as needed since self-adhesive vinyl is sensitive to heat changes.

Use the following tables as guides for the relationship between curing and drying temperature on the HP Latex Printers.

### Heating/Drying Temperature

The heat applied in the printing zone removes water and fixes the image to the substrate.

HP recommends changing temperature in steps of 5°C (41°F) as many times as needed since self-adhesive vinyl is sensitive to heat.

### Guidelines for the drying and curing temperature settings for the HP Latex 800 series printers

Curing (°C)	80	80	85	85	90	90	95	95	100	100
Drying (°C)	55	60	55	60	55	60	55	60	55	60

### Guidelines for the drying and curing temperature settings for the HP Latex 200 series printers

Curing (°C)	100	100	105	105	110	110	115	115	120	120
Drying (°C)	50	55	50	55	50	55	50	55	50	55

### Substrate Tension

Tension is applied at the input and the output side. It must be evenly distributed along the entire width of the substrate, thus substrate load is a critical operation. HP recommends changing substrate tensions in steps of 10 N/m.

**Note:** Input tension should be higher than output tension and the maximum gap between input and output tension is restricted to 25 N/m.

**Note:** Output tension should be increased whenever vacuum pressure is increased.

**Note:** For HP Latex 200 series printers only, input tension is provided.

### Airflow Power

The airflow generated by the fans in the curing module is split into two air layers, one reaching the print zone and the other at the end of the curing zone. This is needed to help remove the moisture and additives while the substrate is being heated by the drying and curing zones. HP recommends changing airflow power in increments of 10%.

### Vacuum Pressure

The vacuum applied to the substrate in the printing zone helps to hold the substrate down on the print platen, keeping the distance to the printheads constant. When optimizing vacuum levels, HP recommends doing it in steps of 5-mm H<sub>2</sub>O.

## Optimizing image quality

This page gives you an overview of different settings and parameters that can be changed to optimize the print quality when printing self-adhesive vinyl with HP Latex Printers<sup>1</sup>.

### Download the most current firmware and change settings “on the fly”:

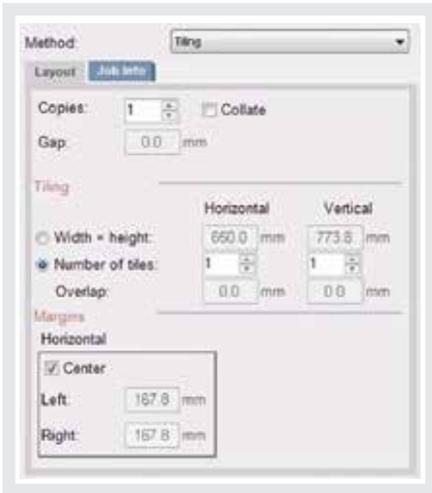
With the most current firmware for HP Latex Printers, it is no longer necessary to pause the print job to change settings. Adjustments can be made while printing, speeding up the process for you.

### Basic settings to change when optimizing print quality

The settings in the table can be modified to optimize print quality or when printing a custom substrate.

<sup>1</sup> For more details see the Printer User's guide.

## Tips and tricks for printing self-adhesive vinyl for vehicle graphics



### Use the tiling feature to optimize matching colors between panels

In vehicle graphics, the use of several panels makes it important that colors match between the panels. The tiling feature, which is available in the RIP or directly in the IPS on your HP Latex 800 series printers can be used for this purpose. This is especially useful when printing solid color fills. Tiling automatically cuts your image into sections and prints the sections separately.

### There are two alternative ways to select the size of the sections:

1. Select the width and height of each section. The number of sections is then calculated automatically.
2. Select the number of horizontal and vertical sections. The width and height of each section is then calculated automatically.

**Note:** Tiling of solid color images at times leads to color inconsistency between tiling panels. To prevent this, flipping every other tile 180° is recommended. See below for more details. See the Image Quality Troubleshooting Guide for more information: [hp.com/go/LX850/media](http://hp.com/go/LX850/media).

### Apply spit bars for improved color consistency

Spit bars can be applied while printing wide solid color panels for optimal color

consistency. Spit bars capture the first ink from the printheads ensuring that the printheads are in an optimal state.

### Smooth vinyl with no wrinkles

Applicable only for the HP Latex 850 Printer: If you are loading a vinyl substrate, HP recommends using the output diverter from the ink collector kit to minimize wrinkles.

### Importance of the Drying and Heating Temperature in the Printing Process

Since HP Latex Inks are fully cured inside the printers, heating is required during the process. Self-adhesive vinyl is a material that is heat sensitive and if an excessive curing or heating temperature is applied, the behavior of the vinyl can be changed; e.g. show signs of curling, formation of bubbles, or shrinking or expanding of the media. Should you observe any change in the self-adhesive vinyl media, lowering the curing and/or heating temperatures eliminates or minimizes this behavior (lower the heating/curing temperature in steps of 5°C (41°F)).

Should you observe ink bleeding, ink not dried thoroughly or ink coalesced, solve this by increasing the curing and heating temperature in steps of 5°C (41°F).

Please refer to the "Image Quality Troubleshooting Guide" for more information. See [hp.com/go/latex](http://hp.com/go/latex).



Learn more at  
[hp.com/go/latex](http://hp.com/go/latex)

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**DESIGNSUPPLY**  
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0800 018 23 23  
[sales@designsupply.com](mailto:sales@designsupply.com)

