

How to print temporary textiles

The HP Latex Printing Technologies
Application Guide



Printing textiles with HP Latex printing technologies



Preparation before printing

Preparation before loading the textile

For best results when printing textiles with HP Latex Printing Technologies, HP recommends the following:

1. Check that temperature/humidity in the room are within the recommended range

Extremely high/low temperature and humidity can affect behavior of media and/or printhead reliability. See Table 2

Table 2. Specification of printing environment

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

2. Check which is the correct side for printing

It can be difficult to identify the correct printing side. Prior to printing, read the label inside the core or the note inserted into the package of the textile to determine the correct printing side. Printing on the incorrect side can result in low color saturation and poor water resistance can be expected.

3. Check that the substrate is correctly attached to the input core.

Otherwise, you will see poor print quality such as banding or color mis-registration due to substrate advance/skew errors.



Preparation before printing a larger print job

Before a larger print job, or after not printing for a long period of time, or while ambient temperature/humidity varies significantly, 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. Printhead alignment.

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

Note: Manual printhead alignment other than automatic is always required when printing textiles since perforation and texture on textiles could impact automatic measurement precision.

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

3. Color recalibration.

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 recalibration on highly perforated textiles is not supported.

Printers referred to in this document

HP Latex 200 series

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)

HP Latex 800 series

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)

There are various 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 textiles.

HP Latex 200 series printers parent substrates and ink level

In the RIP profile database, the textile profiles below are ready for customers to copy and fine tune.

- HP Light Textile Display Banner: High Ink; 12 pass
- HP Satin Canvas : Normal level; 16 pass

HP Latex 800 series printers parent substrates and ink level

- Fabric - Polyester Fabric –100%, 150%, 250%
- Specialty- Canvas Polyester –100%, 150%, 250%

As well as tested HP printing material profiles ready in IPS

- Fabric - HP Heavy Textile Banner – 250%
- Specialty - HP Satin Canvas – 150%

The printing process

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.

It is important to note that no textile 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 textile that you want to use is not available on the Media Solutions Locator, see the “Create 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 the instructions below on how to print with HP Latex 800 series printers and HP Latex 200 series printers.

The printing process: Printing with HP Latex 800 series printers

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

1. Loading of Textile

- a) In the Internal Print Server on the HP Latex 800 series printers go to: Substrate> Load/Unload.
- b) Keep the media smooth and taught and make sure that there are no wrinkles or creases.
- c) Avoid telescoping on the input roll.
- d) Install the ink collector kit before printing on porous textiles (available only on HP Scitex LX800 Industrial and HP Latex 850 printers).



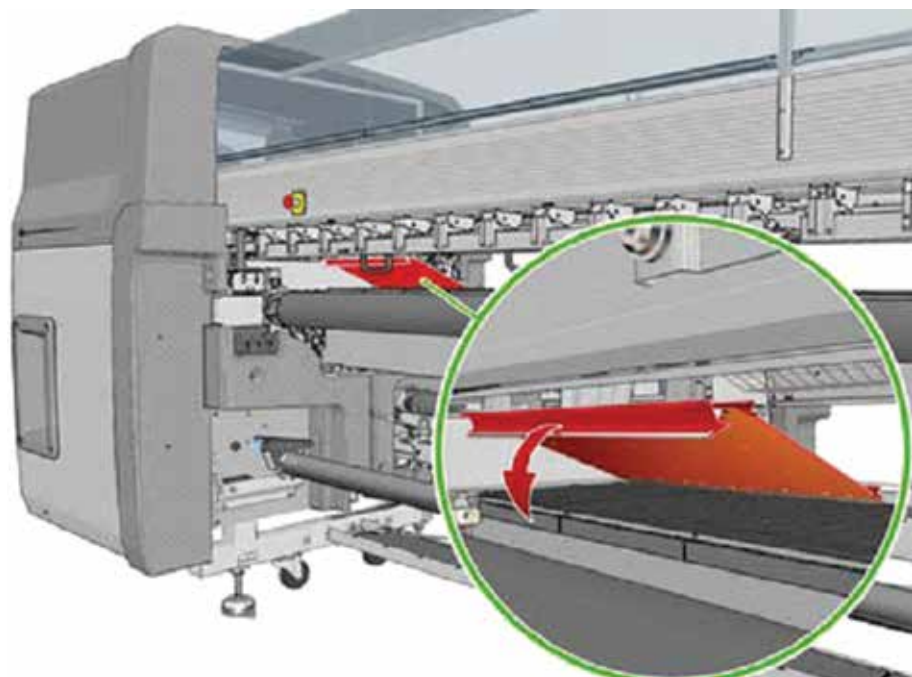
You must install the ink collector kit (as pictured below) provided with your printer to protect the printer from the ink that falls through the porous textile. The kit must be removed before printing on non-porous substrates.



- ¹ Ink collector container
- ² 8-ink collector with replaceable foam

The foams in the collector act as a sponge, gradually absorbing more and more ink. When the ink reaches the level of the ink collector ribs, the ink may begin to touch the bottom of the substrate, leaving marks. At this point, you should replace the foams with new ones. In normal usage conditions, foams should be replaced after printing 50 rolls, assuming the material is a textile with 20% porosity.

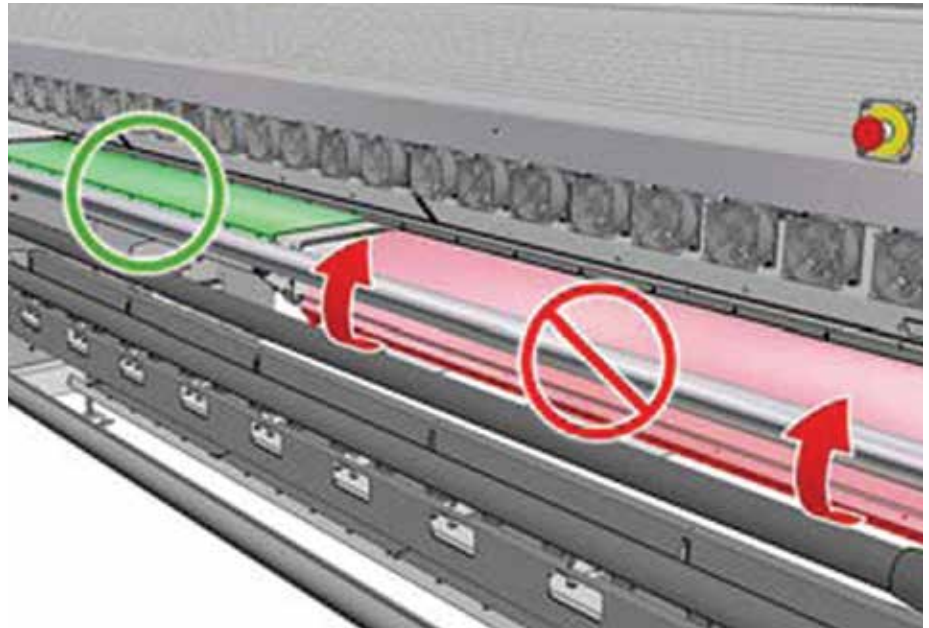
The figure below shows a printer with a one-piece ink collector installed.



For further details on the ink collector, please see HP Scitex LX800 Industrial and HP Latex 850 printers User Guide and Maintenance Guide

The ink collector supports flag and mesh substrates that have a weight $\geq 100 \text{ g/m}^2$, and porosity $\leq 20\%$. More open weave substrates (such as voile, mesh, sprinkler, or taft) are not supported.

e) Follow loading instructions to place the curing plate in a horizontal position (for the HP Scitex LX800 Industrial and HP Latex 600/820/850 printers), before printing.



Note: The curing plate should be kept in the down position when the ink collector is installed.

Note: This does not apply for the HP Designjet L65500 Printer.

f) Make sure that the position of the media in the input and output is well aligned. If necessary, unload and reload the media.

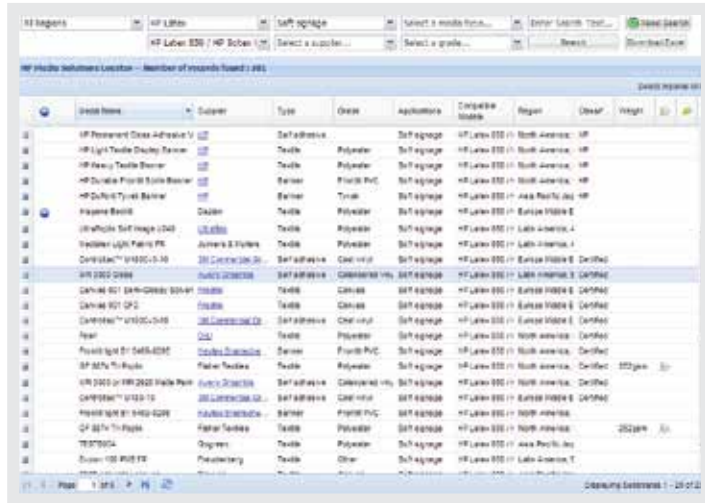
g) Load media.

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.

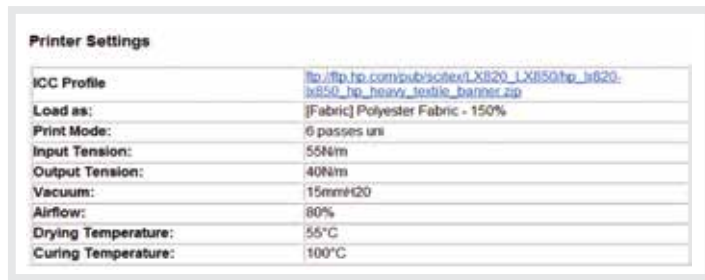


2. Download media settings and color profiles

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



Note: For the HP Scitex LX800 Industrial and HP Latex 600/820/850 printers, printer settings (OMS file) are included in the zipped file of the ICC row.



For the HP Designjet L65500 Printer, printer settings (instead of the OMS file) are downloaded and must be entered manually into the printer at the printer configuration page.

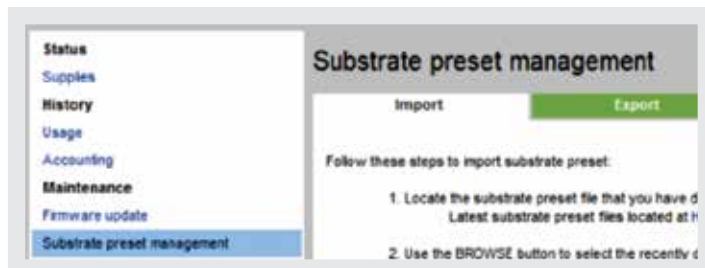
Is your media not available on the Media Solutions Locator?

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 following the instructions in the “Add a new substrate guide” to achieve optimal results.

3. Create a new substrate type

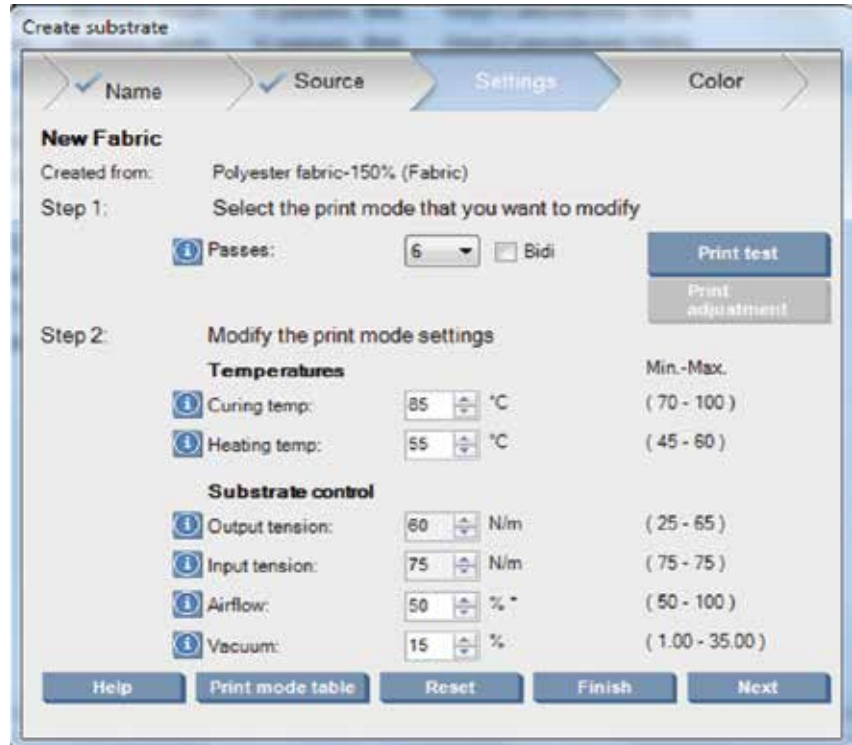
Import the print presets into your printer by using the EWS (Embedded Web Server). Click on Substrate Presets Management and import your saved .OMS file. Once the file has been imported, the printer automatically creates a new substrate type stored under the “customs category”. All settings are automatically specified for every print mode as shown in Figure 1.

Import OMS File through EWS.



Note: For the HP Designjet L65500 Printer, simply copy the printer settings into the corresponding IPS column.

Parents substrates in the HP Latex 800 series printers



4. Color Calibration:

Click on Substrate / Settings / Color / Print Plot to perform an automatic color calibration.

Once the automatic color calibration is done, the ink restriction value will be changed accordingly based on measurement results and displayed at the ink restriction value interface (shown below in Figure 3). The value can also be modified manually for customized application requirements

Note: Color calibration on heavy perforated textiles is not supported.

Ink restriction value interface



5. Import the .ICC file into your RIP

Note: If you prefer to generate new ICC profiles on specific media that is not listed in the media locator, a Barbieri 6 mm aperture lens is recommended (rather than 2 mm) for patch measurement in order to minimize surface texture impact.

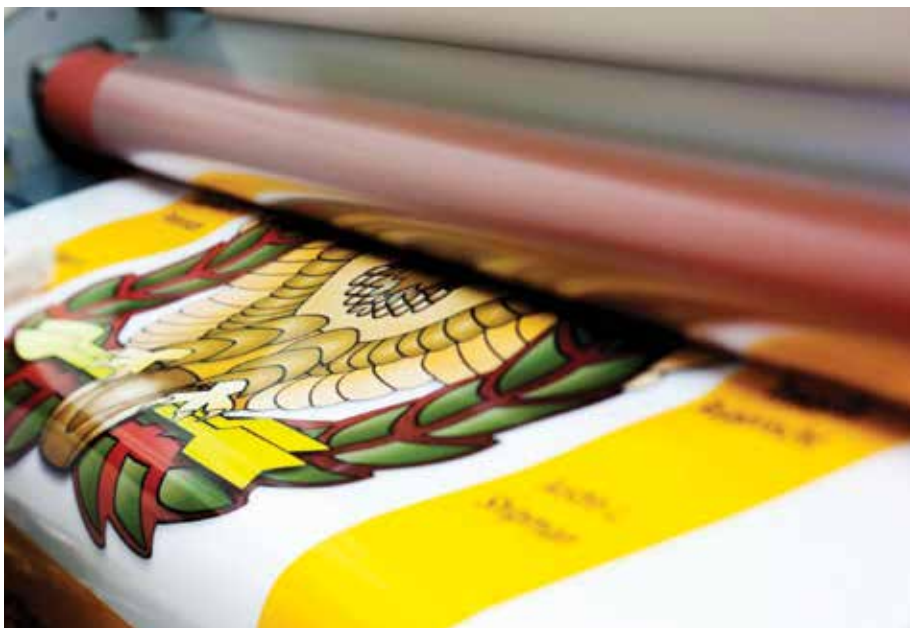
6. Specify print mode and substrate and send this job to the Internal Print Server

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



The printing process: Printing with HP Latex 200 series printers

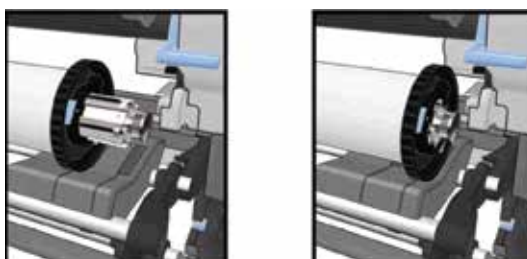
HP recommended print modes

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 the media 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 the substrate is smaller than printer width, it's better to locate the substrate in the 2nd position of the spindle so it is as central as possible to improve the drying process.

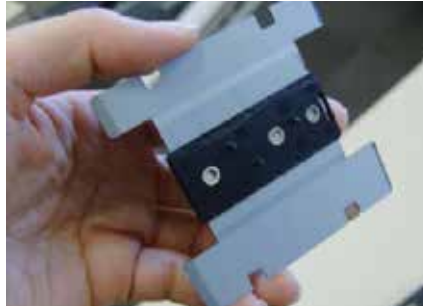
Figure 1



e) After the printer beeps, select the correct substrate category “fabric” from the front panel.

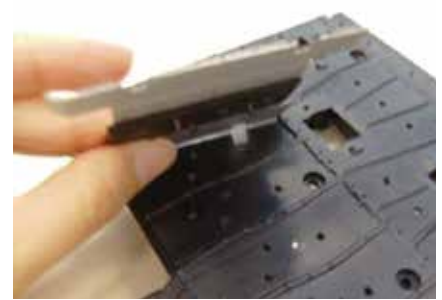
f) Install the edge holders.

Figure 2



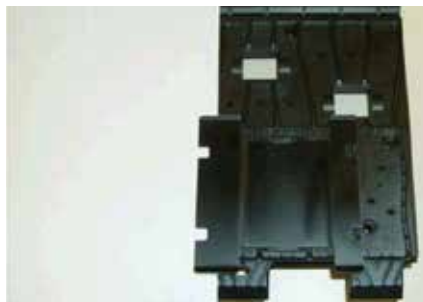
The magnetic edge holders are recommended for fabric printing and designed to prevent the edges of the substrate from rising while printing.

Figure 3



The edge holders should be placed on the platen so that they slightly overlap the left and right edges of the substrate. The edge holders fit into holes in the platen, and they are magnetic, which helps them to stay in place.

Figure 4



The following picture shows an edge holder in place, overlapping the edge of the substrate.

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.

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.

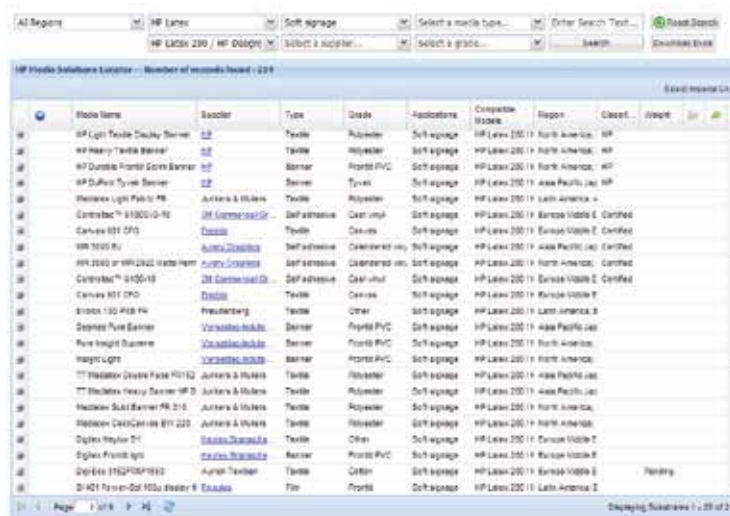
Tips: It is recommended to use the textile loading tool in the loading process of soft textile material with HP Latex 260 and 280 printers.

Tips for the HP Designjet L25500 Printer series: If you do not have a textile loading tool, an alternative is to cut a strip of another substrate of a similar width to the textile and around 0.5 m in length. Polyester (backlit) substrates are the best for this purpose because of their stiffness. Lay this strip of substrate on top of the leading edge of the textile and load the two together as described below. After loading, the substrate strip will probably fall on the floor on the far side of the printer; if not, remove it.

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.



Note: For the HP Latex 200 series printers, download the file in terms of RIP (.OML for Onyx and .CALPATCH for Caldera) from the media locator and then import to the corresponding RIP.

Is your media not available on the Media Solutions Locator?

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 following the instructions in the “Add a new substrate guide” to achieve optimal results.

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.

The printing process

This page gives you an overview of different settings and parameters that can be changed to optimize the print quality when printing textiles with HP Latex printers.

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 changed while printing, speeding up the process for you.

Basic settings to change when optimizing print quality

All the settings below can be modified to optimize print quality or when printing a custom substrate.

Recommended default setting

Recommended default settings in the HP Latex 800 series printers for parent substrate “Fabric.”



Table 1. Application of outdoor temporary textile/flag and backlit/light box display

Substrate family	Printmode	Ink level	Drying Temp	Curing Temp	Heating Airflow	Autotracking (OMAS)	Input Tension	Output Tension	Vacuum
Fabric	10 Pass Bidi	250%	55	85	60	Yes	55	40	15
	6 Pass Bidi	150%	55	95	50	Yes	65	50	15
Fabric	12 Pass Bidi	High	55	100	35	Yes	15		20

Recommended default settings in the HP Latex 200 series printers for parent substrate “Fabric.”

Table 2. Application of outdoor temporary textile/flag and backlit/light box display

Substrate family	Printmode	Ink level	Drying Temp	Curing Temp	Heating Airflow	Autotracking (OMAS)	Input Tension	Vacuum
Fabric	12 Pass Bidi	High	55	100	35	Yes	15	20

Table 3. Application of indoor temporary textile:

Substrate family	Printmode	Ink level	Drying Temp	Curing Temp	Heating Airflow	Autotracking (OMAS)	Input Tension	Vacuum
Fabric	12 Pass Bidi	Normal	55	95	30	Yes	15	20

Print Modes

There are many print modes available for optimizing productivity and image quality. For the HP Latex 850 Printer, the substrate type “Fabric-Polyester 250%” includes 10, 14, and 18 passes. For the HP Latex 260 Printer, the high ink level allows 12, 16, 20, 24, and 28 pass printing.

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.

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 textiles are sensitive to heat.



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 textiles are sensitive to heat. Use the following tables as guides for the relationship between curing and drying temperature on the HP Latex 800 series printers and the HP Latex 200 series printers.

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

Curing (°C)	85	80	85	85	85	90	90	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)	90	90	95	95	100	100	105	105	110	110
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.

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

Tips: Output tension should be increased whenever vacuum pressure is increased.

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

Airflow Power

The airflow generated by the fans in the curing model 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 co-solvents 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 mmH2O.



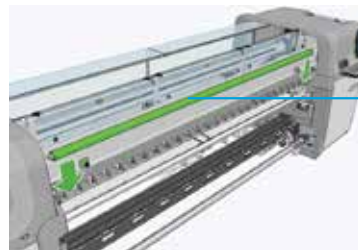
Tips and tricks for printing on textiles

Apply accessory to prevent wrinkles

Because of the tendency of textile to stretch, wrinkles commonly occur.

For the HP Scitex LX800 and HP Latex 820/850 printers

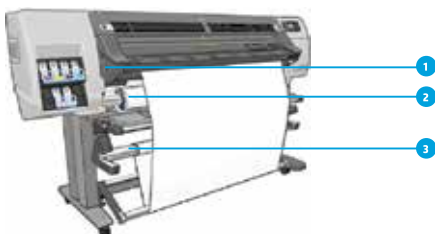
Use the tension increment for efficient adjustment. To address tension difference between the center and edge of the media during printing, use the output diverter roll to synchronize tension across the media roll to avoid wrinkles that can result in a printhead crash.



• Output diverter tool

For the HP Latex 200 series printers

The approach is similar to that for the HP Latex 800 series printers, however, because no output roll is provided, we recommend:



- 1 Lower the loading table
- 2 Use the take-up roll to collect the printout
- 3 Apply the loop shaper playing output tension role

Note: For the HP Designjet L25500 Printer series without the loop shaper, use the heavy media core instead, per the figure below.

Apply curing plate to maintain heat

This only applies for the HP Scitex LX800 and HP Latex 820/850 printers.

The curing plate must always be lifted up in a horizontal position for textile printing, unless the ink collector is installed for porous textile printing, because they conflict with each other mechanically.

The metal curing plate reflects an infrared beam that penetrates through the media, helping maintain heat to dry/cure the ink on the substrate more efficiently, and keeping the temperature sensor working properly.

Please refer to the "Image Quality Troubleshooting Guide" for more information. See hp.com/go/LX850/media

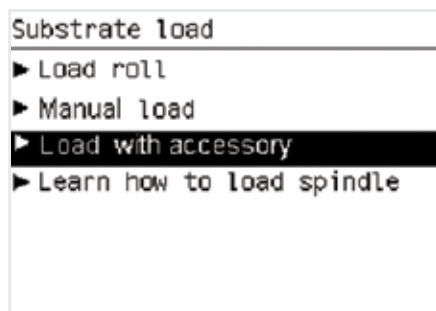
Textile Loading

This only applies for the HP Latex 260 and 280 printers.

Due to certain elasticity of textiles, loading work becomes tough while leading media to the printing zone. The loading accessory is designed to help in loading banner/textile/mesh substrates.

The process to utilize the loading accessory is:

Note: The media loading tool for the HP Latex 820 and 850 printers can also be used for loading textiles on those printers.



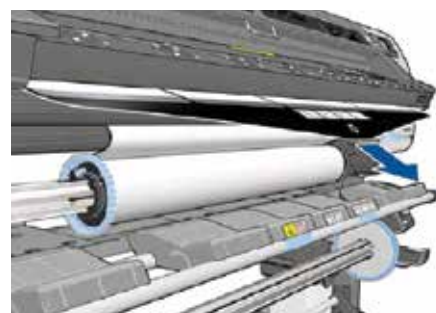
¹ Select "Load with accessory" from the front panel.



² Lay the textile loading accessory on the loading table and put textile substrate leading edge from the roll on the loading accessory.



³ Flip the white flaps back to cover the leading edge of the substrate. The black patches are magnetic and grip the substrate.



⁵ Once the substrate has been loaded, simply remove the textile loading accessory by opening the black patches.

⁴ The loading accessory passes through the printer's substrate path with the substrate.

Ink load and color saturation

High ink loads are recommended to maximize the color saturation in textiles, but too much ink may obscure details and ink may run through to the back of lighter weight textiles. Hence, utilizing the right settings for the specific media and application is essential. To obtain a list of recommended settings, please go to the Media Solutions Locator:

hp.com/go/mediasolutionslocator

For more information, please visit:
hp.com/go/latex

© Copyright 2013 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

4AA4-1116EEW, October 2013, Rev.2

