Cookbook – HP Latex Print and Cut Solution

1 Table of contents

2 Overview

2.1 Who can benefit from reading this document?

This document is intended for:

- Owners and operators of the HP Latex 115 Print and Cut Solution, the HP Latex 315 Print and Cut Solution and the HP Latex 335 Print and Cut Solution.

This document provides information about:

- The main HP Latex Print and Cut Solution features and possibilities.

- The HP Latex Print and Cut workflow.

- How to get the best results for a wide range of applications and materials.

3 The HP Latex Print and Cut Solution

3.1 HP Latex Print and Cut Portfolio

		HP Latex 115 Print and Cut Solution	HP Latex 315 Print and Cut Solution	HP Latex 335 Print and Cut Solution
HP Latex printer	Max media width	137.1 cm (54 inch)		162.5 cm (64 inch)
	Max loading	25 kg (55 lb.)		42 kg (92.6 lb.)
	HP Latex Inks	HP 821 Latex Ink 400 mL cartridges	HP 831 Latex Ink 775 mL cartridges	
HP Latex cutter	Cut width	135 cm (53.1 inch)		158 cm (62.2 inch)

3.2 Multiple applications for print and cut

Labels & stickers

Custom clothing

Floor graphics

Wall decals

Window graphics

Vehicle graphics

4 How to get the best results from the HP Latex Print and Cut Solution

4.1 Workflow

Job creation	Job edition and managment	Print	Lamination	Cut
Wall Decoration apps and **HP Signage Suite** Design in 3 simple steps.	**HP Flexi Print and CUT RIP** and **Production Manager** Edit your images. Automatic cut lines. Generic cut and print profiles. Automatically includes the **HP Barcode** and **OPOS**	**HP Latex Printer 115/315/335** High quality with speed. Instant-dry. X-axis cutter.	Avoid laminating **short term jobs** with scratch-resistant prints. If required Laminate after printing.	**HP Latex Cutter** Reliable and unattended cutting. High cut speed.

4.2 Job creation

4.2.1 HP Applications Center overview

HP Applications Center is a **Cloud-based application** used to customize wall decoration and signage applications, as well as for residential, retail or commercial purposes. Further information can be found at: https://www.hpapplicationscenter.com/

It includes several applications, which are listed below:

The **Wall Decoration apps** include:
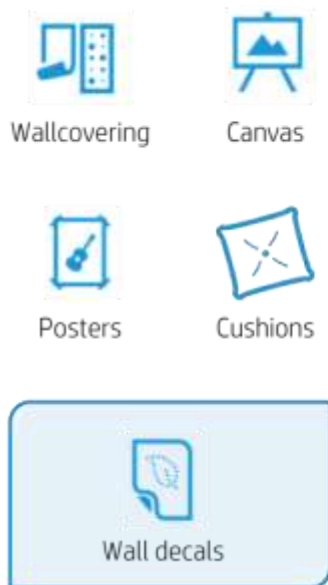
The **Signage Suite apps** include:

Wallcovering   Canvas

Roll-Ups   Banners   City lights   Commercial posters

Posters   Cushions

T-shirts & Sweatshirts   Stickers & Magnets   Vehicle stickers

Wall decals

Windows graphics   Floor graphics

• : Using Print and Cut

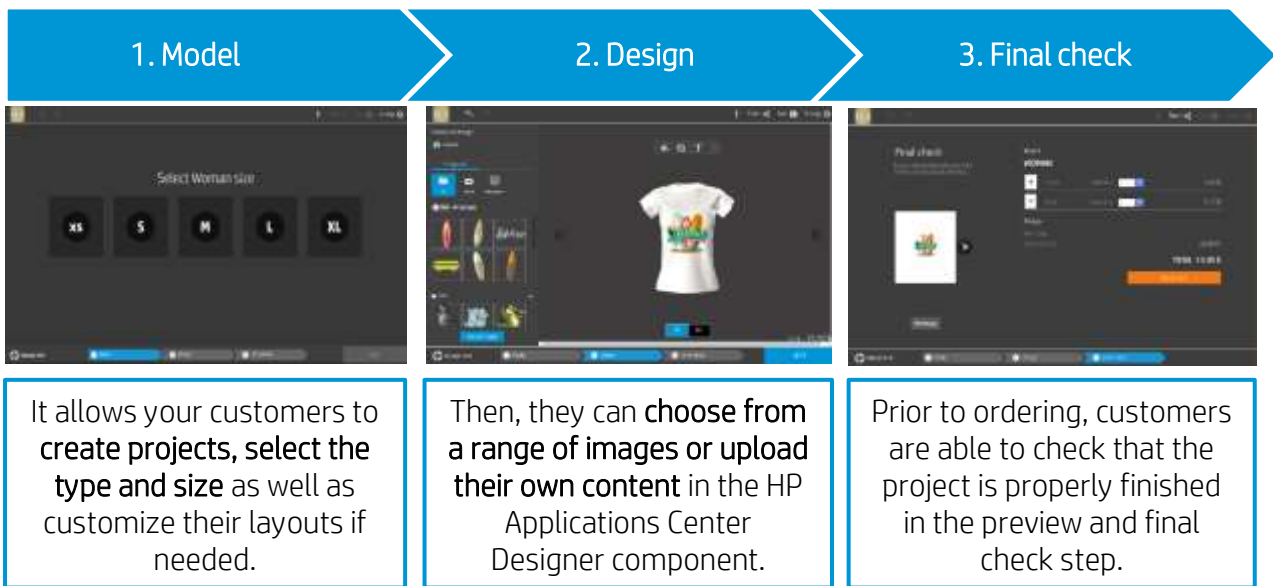### 4.2.2 Benefits of HP Applications Center

These are some of the **outstanding features** offered by the HP Applications Center:

- Friendly 3–step design tool designed for **non-expert users**.
- **3D visualization** for applications requiring it.
- Access to content libraries.
- Predefined templates.
- **Easy management** of production, customers and content.
- Automatic **ready to print PDF** generation, which saves time and reduces errors.
- Automatic job **download with JDF support** and PDF file versioning control.
- **Easy integration** into PSP websites: External hyperlinks, CRM plugins based on pre-defined templates or API website integration.
- **Print and Cut technology** used in several apps.

4.2.3 Example

1. Model	2. Design	3. Final check
It allows your customers to **create projects, select the type and size** as well as customize their layouts if needed.	Then, they can **choose from a range of images or upload their own content** in the HP Applications Center Designer component.	Prior to ordering, customers are able to check that the project is properly finished in the preview and final check step.

As a PSP, you can access a dashboard containing the orders received, where you can download them as **ready-to-print PDF** files. It allows for the creation of a personalized experience with an integrated end-to-end process including **e-commerce capabilities**.

Remember, integration to your website can be done by following two alternative paths:

- Either by using the plugin, or
- with the API itself.

4.2.4   How to create an HP Applications Center account

You can create an HP Applications Center account on the website: www.hpapplicationscenter.com

You only need to **register your HP Latex printer** with this **free application** by providing its serial number during the registration process.
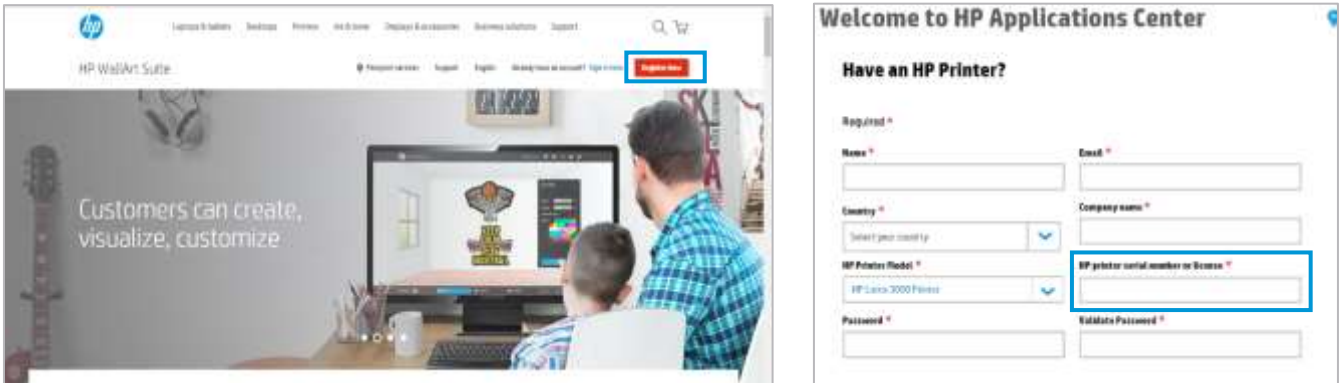
Also, you can access your HP Applications Center account from your connected **PrintOS account.**

4.3   Job edition and management – RIP

Jobs can either be created with HP Signage Suite, HP Flexi Print & Cut, or with any other graphic design software.

The following sections briefly explain the steps required to prepare your job with the HP Flexi PRINT and CUT **RIP** and to get ready to print and cut.

4.3.1   Job workflows

There are 3 main workflows:

1. Files **with contour marks** – Direct to Production Manager HP Edition.

2. Files **without contour marks** – Edit with HP Flexi Print and Cut Editor.

3. **Direct cutting** – Edit with HP Flexi Print and Cut Editor.

4.3.2   Adding contour marks

HP Flexi PRINT and Cut Editor allows you to select the paths in your image file and to add the contour marks:

▢ Add contour lines – *Effects* menu > *Contour cut.*

Some image types may require further steps:

Vectors / masks	Bitmaps / color traces	Direct cut
Remove any unnecessary background, and select only the outline paths you want to add a contour line to	For bitmaps, make the background transparent. The Color Trace option helps to create a higher quality contour cut.	In this case, no contour lines are needed. Create your design and Cut/Plot.

You can find further details in the HP Flexi Print and Cut Editor tutorial: *Help* menu > *Flexi Tutorial.*
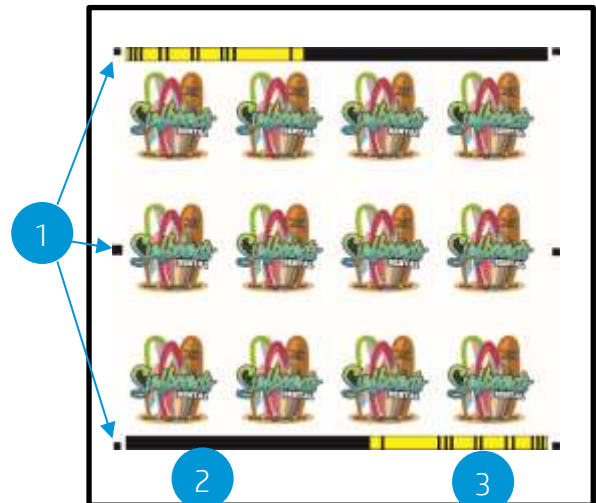
4.3.3   HP barcode

Contour cutting is made possible by the highly accurate **Optical POsitioning System** (**OPOS**).

The **OPOS sensor** is mounted underneath the tool carriage and detects the various registration marks printed on the substrate.

The **HP barcode** is the group of elements printed on the substrate to be cut, that allow the cutter's OPOS sensor to identify what cuts should be made and where.

It consists of **three items**:

1. **Registration marks**: Small squares that help the cutter to locate the job accurately, and to compensate for skew and deformation.

2. An **OPOS XY** line: A line at the beginning of the job that helps the cutter to compensate for deformation across the width of the job (bow deformation).

3. **Blinking lines (yellow)**: A code that can be placed on both sides of the job, improving productivity, as **you can feed in the substrate starting at either end**.
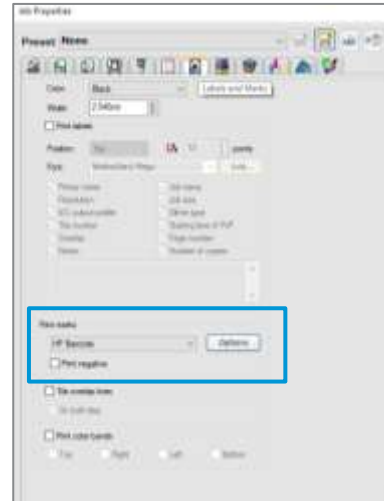
The HP barcode is added by default, but can be deactivated to select other type of registration marks: **OPOS** or **OPOS XY**. These marks do not allow for **unattended** cutting tasks.

- OPOS– only registration marks are printed.

- OPOS XY – registration marks and a horizontal line are printed for deformation correction.
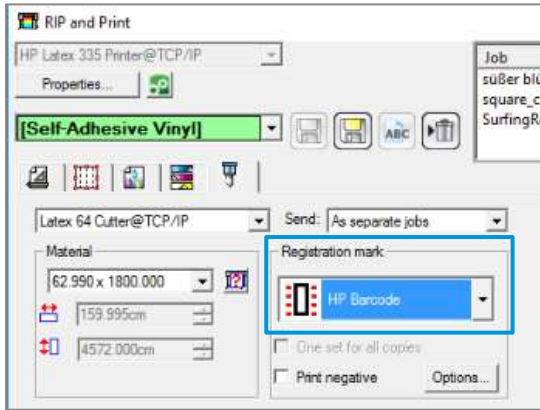
HP Flexi PRINT   Production Manager
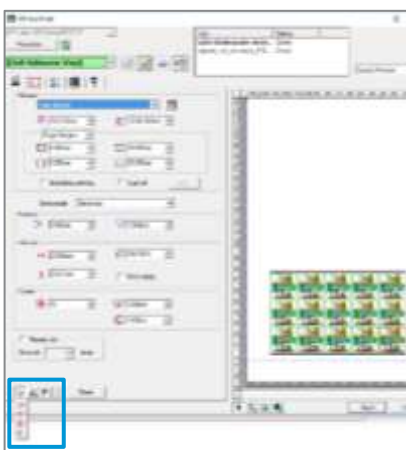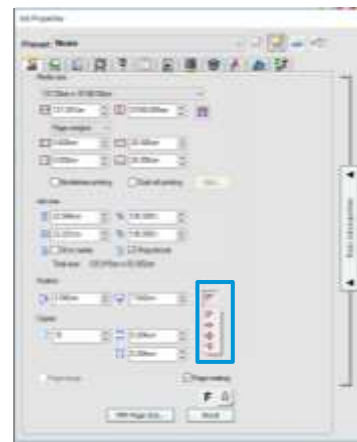

4.3.4   Job alignment

By default, jobs are aligned on the **right side of the substrate**.

It is important to use the **same alignment for all the jobs** you wish to print and cut together on the same substrate to ensure that the sensor can read the HP barcodes of consecutive jobs.

HP Flexi PRINT   Production Manager

4.3.5   Printing parameters

In order to get the best results from your substrate, printer and cutter, set up your printer options as follows. Please note that words **substrate** and **media** are used indistinctively.

Set substrate presets

Option 1. Using HP Flexi Print and Cut Editor

1a. Go to **RIP and Print.**

1b. Go to the **Advanced Options** menu.

1c. Choose **Use color correction.**

1d. Select the correct **Output profile.**

1e. Select the **Media** you have loaded in the printer.

1f. Select the highest resolution: **600x600 dpi.**
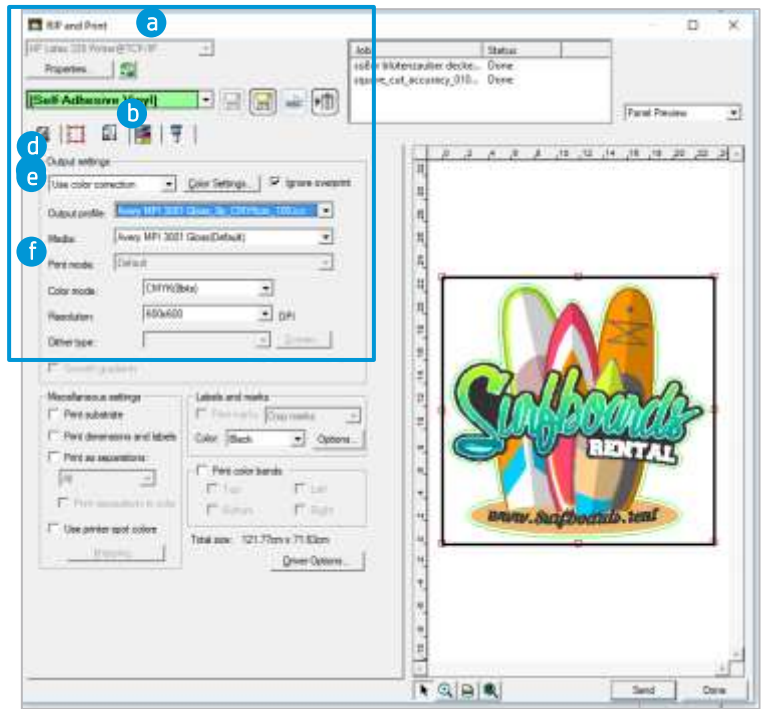
Option 2. Using Production Manager HP Edition

2a. Select your job, and go to **Job Properties.**

2b. In the **Printer Options** menu:

2c. Click on **Read media** from printer.

2d. Click **Download ICC.**

2e. Choose the correct **Category, Media** and **Print Mode.**
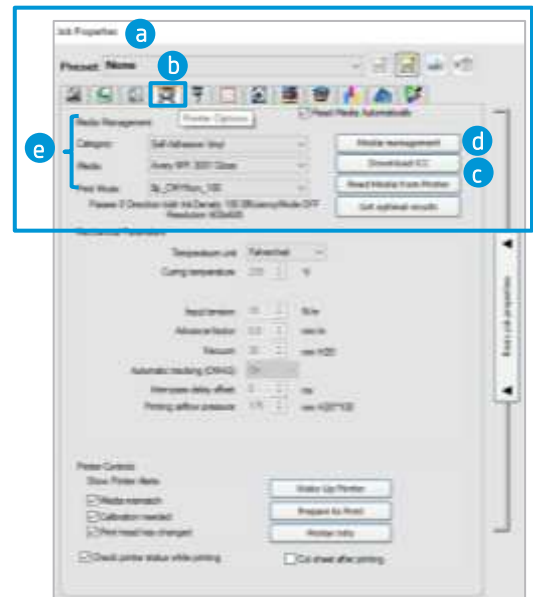
2f. Finally, in the **Color Management** menu:

2g. Choose **Use color correction.**

2h. Select the correct **Output profile.**

2i. Select the **Media** you have loaded in the printer.
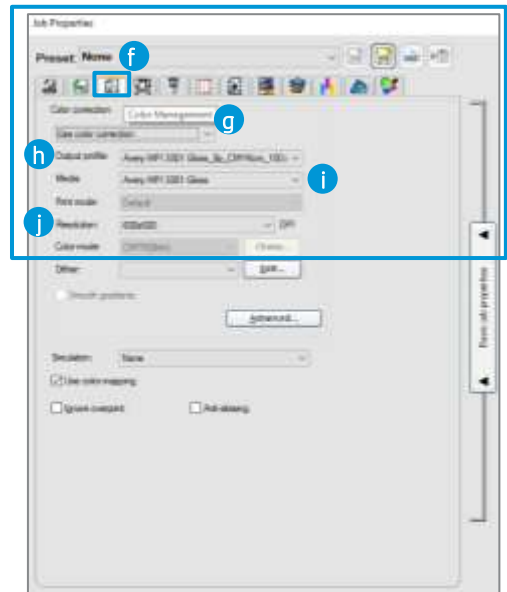
2j. Select the highest resolution: **600x600 dpi.**
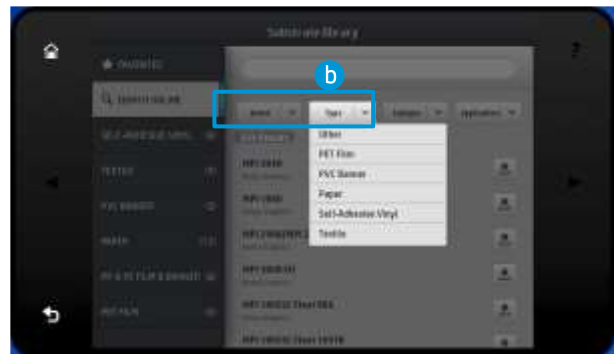
How to install your substrate presets

If you are using a material which is Certified for HP Latex inks, you can use its substrate presets. You can either install them from the **printer's front panel** or download them from the **PrintOS Media Locator**. You can also create your **own specific substrate presets**.

Option 1. Install from the printer's front panel

1a. Click on the **Online Search** button.
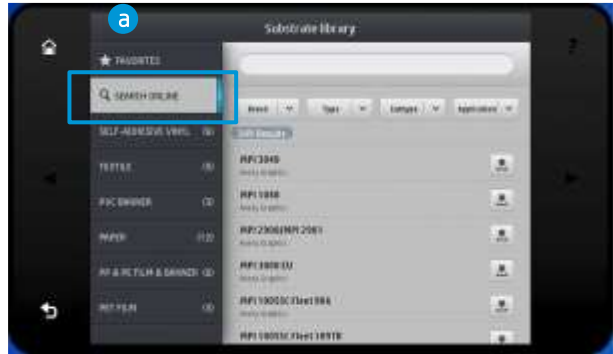
1b. Then, filter by **Type, Brand, Classification** and **Application**; select the substrate from the dropdown list.

1c. Once you have located the substrate preset of your choice, pressing its **download icon** will queue it for automatic download and installation, which is done in the background.

1d. Supported RIP software synchronize their substrate preset lists with the printer, so that the printer and the RIP will always have the same list.

Option 2. Download your substrate preset from PrintOS Media Locator

2a. All the substrate presets are available from the HP Media Solutions Locator, which is an application within PrintOS: https://www.printos.com/ml/#/medialocator

Create your own substrate preset

- Finally, if you cannot find a ready-made preset for your substrate, and if you prefer not to use a generic preset or edit an existing one, you can make your own preset from scratch.

- The **Add New Substrate** wizard in the printer's front panel guides you in establishing the best settings for your substrate.

- Full instructions can be found in the printer's **User Guide**.

4.3.6   Cutting parameters

Define the **type of cut** and the **cutting parameters** for each contour mark of your job according to the substrate material you are using.

As a starting point, you can select the cutting presets that are already stored in your **HP Flexi Print and Cut Editor** and **Production Manager HP Edition.**

Section 4.5.5 explains how to find the correct cutting settings according to your substrate.

Setting the cutting parameters

Option 1. Using HP Flexi Print and Cut Editor

1a. Go to **RIP and Print**.

1b. In the **Contour** menu, you can set specific cutting parameters for each contour mark.

1c. **Choose a cutting preset with default cutting parameters.**
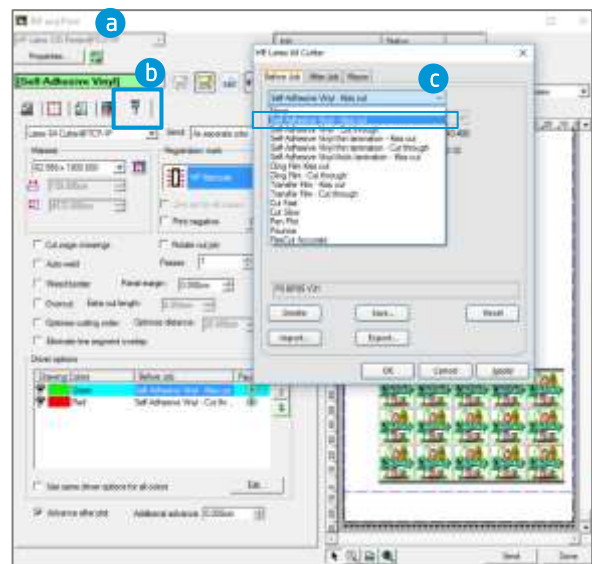
Kiss cut parameters	Cut-through (FlexCut)

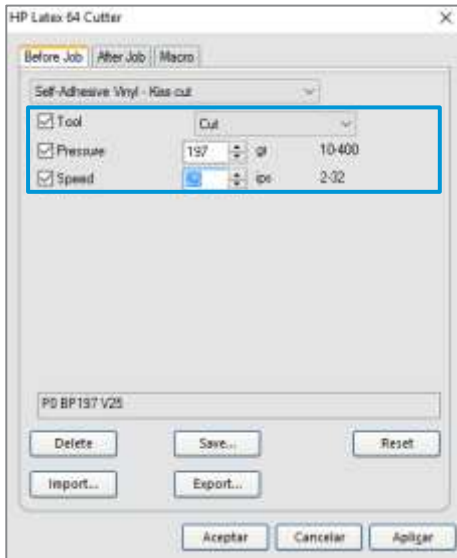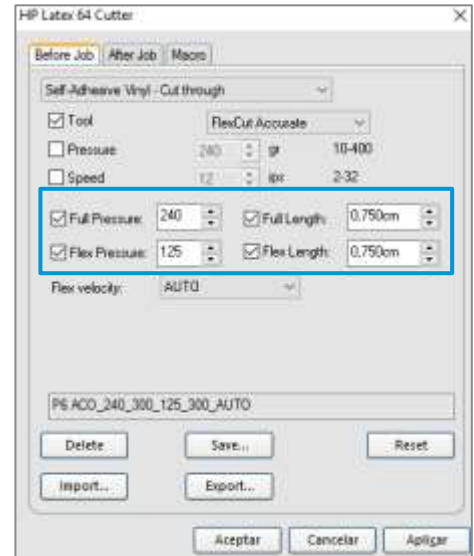1d. You can also modify your cutting parameters according to the results obtained in the tests described in section 4.5.5. Save the new preset with a different name.

1e. To use the cutting settings previously stored in the cutter's **user configuration**, uncheck the cutting parameter check boxes.

Option 2. Using Production Manager HP Edition

2a. Select your job from the printer or cutter queue.

2b. Then go to **Job Properties > Cut menu**.

The next steps are as explained above in HP Flexi Print and Cut Editor.

4.4   Print

4.4.1   Printer setup

Please consider using HP Latex Certified substrates in order to get the best printing performance.

Make sure that the substrate type that you select on the front panel and in your RIP software is the same as the substrate type that is loaded in the printer.

Make sure that the substrate has been calibrated:

- Substrate-advance calibration (if needed)
- Printhead alignment
- Color calibration

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

Important: Some materials may deform when they have been loaded in the printer for several hours and not printed on. In order to prevent possible printhead crashes during loading, advance the substrate forward until the deformed area passes the printing zone.

4.4.2   Send job

After editing and preparing your job, it can be sent to be printed either from the **HP Flexi Print and Cut Editor** or from the **Production Manager HP Edition**.
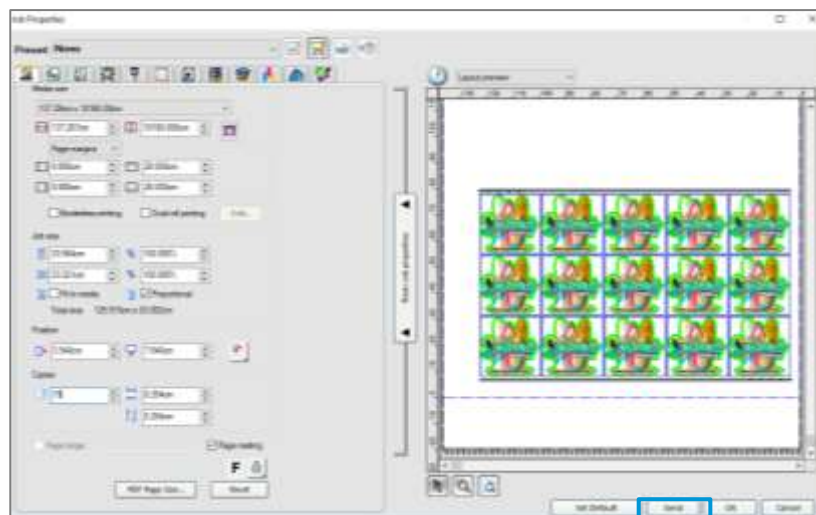
4.5   Cutting

After the job is printed, you can load the substrate directly onto the cutter.
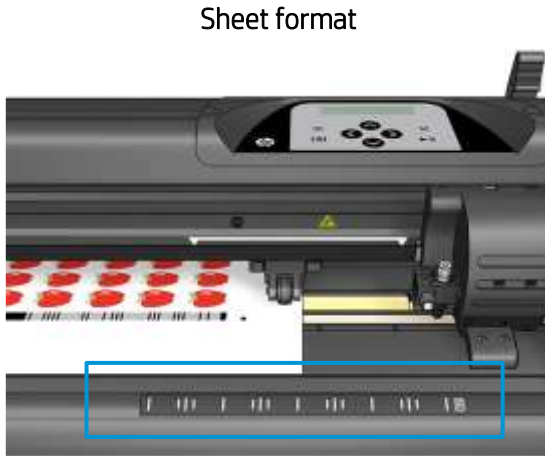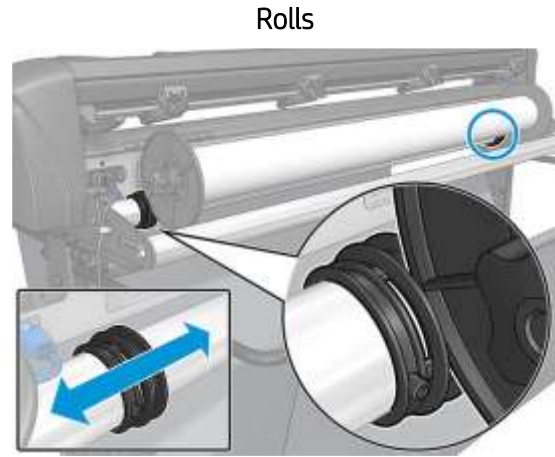
4.5.1   Loading the substrate

Sheet format	Rolls

- Load from the front or the rear
- Use alignment marks –ruler-

- Load from the rear
- Use media flanges for better media advance

When **using the HP barcodes,** there is no need to resend the job from your computer to the cutter. It will retrieve the cutting info from the RIP as long as you keep it in the job queue. In addition, you do not need to worry about job orientation when loading it on the cutter.

When **not using HP barcodes**, you have to send the job to the cutter directly from the **Production Manager HP Edition**; in this case, load the job on the cutter so that first OPOS mark to be read is the one close to the lead printing edge of the plot.

4.5.2   Cutting tool

Type of knife

It is recommended to use the proper knife type for each type of substrate.

Please follow the indications below, based on the substrate thickness:


Material thickness (mm)	36º Drag Blade Standard	60º Drag Blade Specialty	55ª Drag Blade Sandblast
Max. Kiss Cut	0.25	0.60	0.80
Max. Cut Through	0.50	0.60	0.80

Knife depth

Knife depth must be increased when using thicker types of vinyl and decreased when using thinner types of vinyl. In any case, only the knife tip should stick out beyond the knife holder, as shown in picture below.
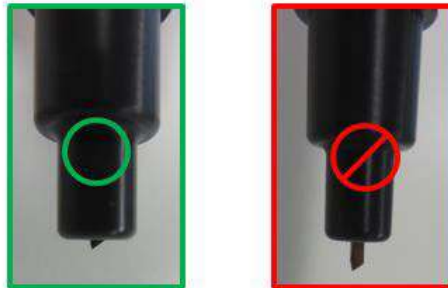
4.5.3   User configurations

There are four user configurations of **cutter parameters**. The parameters can be set to different values for each user, so that you can reconfigure the cutter for a different type of job or substrate quickly and easily by selecting a different user.

- Change user: *Menu > User.*

An asterisk appears by the name of the currently selected user.

4.5.4   Calibrations

The **OPOS sensor** has been calibrated at the factory, but HP recommends doing a test to determine how well the factory-set parameters work with the material you are using. If the accuracy obtained is not satisfactory, then you should perform an OPOS calibration.

From the cutter's front panel: *Menu > System setup > Calibrations.*

OPOS calibration

Cal. OPOS: Calibrates the distance between the knife and the sensor.

Perform this calibration whenever you install a new knife.

Substrate calibration

Cal. Media: Calibrates the reflection levels of the marker color and the substrate color.

Perform this calibration when using colored, translucent, high-gloss or reflective substrates.

> **Important:** Prior to performing the calibration with the cutter, a set of calibration patches need to be printed on the **same material of the cutting job**. Please follow the next steps:

1. Load the material on the printer.
2. Go to Production Manager HP Edition

3. Go to the Menu bar *Setup > Print Cutter Calibration Chart.*

4. The job will print automatically.
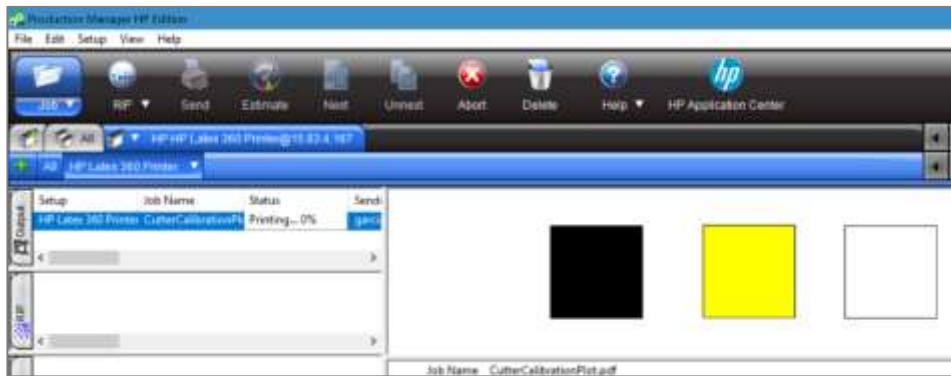
5. Load the printed chart in the cutter.
6. From the cutter's front panel: *Menu > System setup > Calibrations > Cal. Media*
7. Follow the front panel instructions; you will be asked to position the OPOS sensor above each color patch, including the non-printed.

Length calibration

Cal. Length: Allows the length of the cut lines to be adjusted within specifications.

Perform this calibration when using multiple vinyls and match-up is needed between them.

4.5.5   Finding the cutting settings for your material

The cutting presets are given for a limited number of media categories that may not include your specific substrate. Also, the wear on the knife can affect the cutting result.

For these reasons, **it is highly recommended to find the cutting settings** prior to sending a print-and-cut job.

For Kiss cuts (contour cuts)

- The knife cuts completely through the vinyl and slightly into the liner:

Menu > Knife Pressure > Test
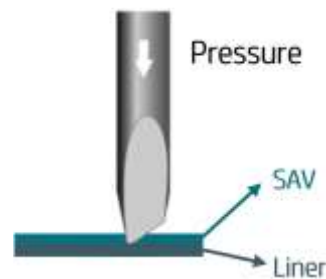
- Check current knife pressure from the cutter's front panel:
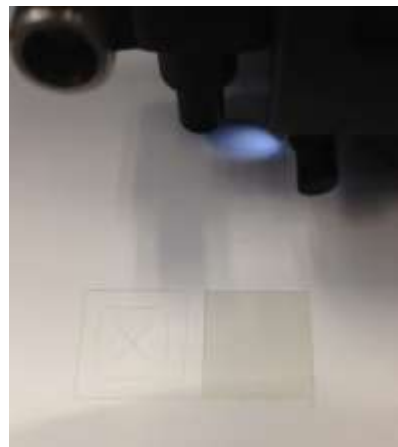
The knife pressure is set correctly when the test pattern cuts completely through the vinyl, the vinyl is removed and the blade tip has visibly scratched the front side of the substrate backing (liner). The blade should never cut through the backing.

- If the result is **not OK**, increase or decrease the knife pressure value and test again.

- The settings can be stored in the current **user's** configuration.

For Cut-throughs (FlexCut)

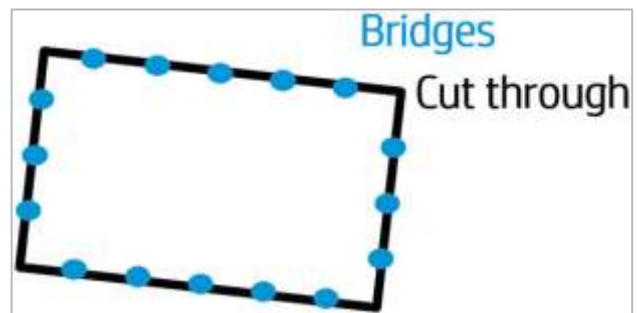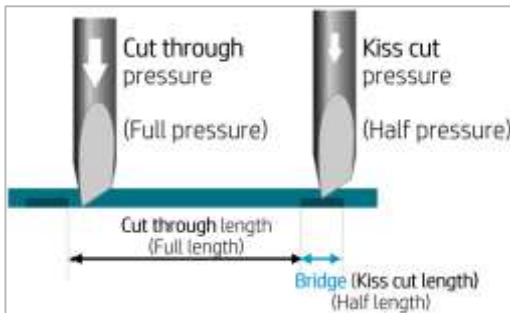- The knife cuts completely through the substrate at some points, and just through the vinyl at others (bridges).

- Check current FlexCut performance from the cutter's front panel: *Menu > FlexCut > Test.*
  The setting is correct when the substrate is cut completely through but the test pattern stays together, so it can later be torn out.
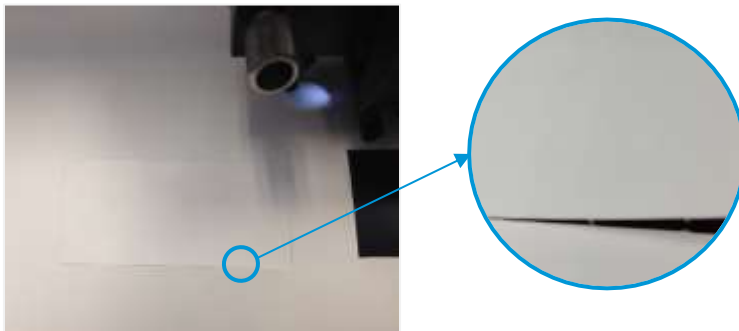
- Adjust the FlexCut settings and test.

- The settings can be stored in the current user's configuration.

Note: The FlexCut option is only reliable with simple shapes like **circles, rectangles,** and **ovals**.

4.6   Cutting presets

The following settings correspond to the **generic presets** provided in the HP Flexi Print and Cut software.

Use these values as a starting point for adjusting the cutting parameters to your specific material.

Material	Kiss Cut	Cut-through	
	Pressure (g)	Full Pressure (g)	Half pressure (g)
Self-Adhesive Vinyl	85	240	125
Self-Adhesive Vinyl thin lamination	170	265	200
Self-Adhesive Vinyl thick lamination	225	N/A	N/A
Cling Film (PET)	210	380	230
Transfer Film (PP)	135	175	155

Note: The following presets are set for the **standard** knife type.

5 Tips for materials

5.1 Get the right cutting accuracy

- Download media presets recommended for Print&Cut:
    1. The Printer's Front Panel:

       Substrate library > Online Search > **Filter by Application > Print & Cut.**
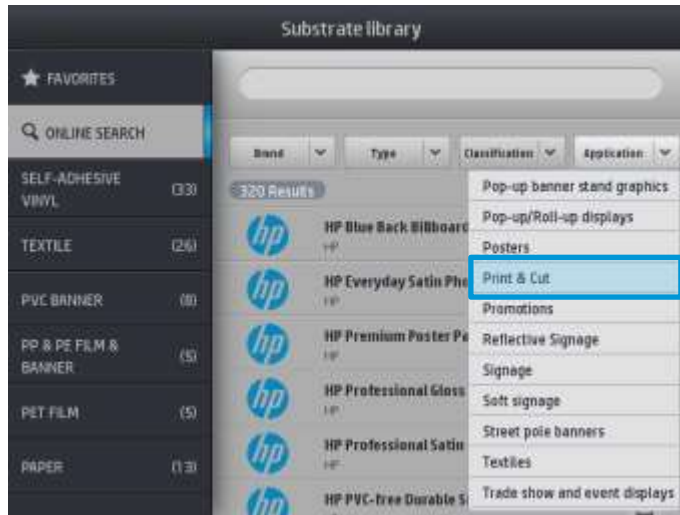
    2. PrintOS Media Locator: https://www.printos.com/ml/#/medialocator

       Choose Latex platform > Filter > Application > Print & Cut.

For **self-adhesive vinyls,** please also follow the tips mentioned in section 5.2.

- If possible, always **use the OPOS mark HP barcode**.

- **Set OPOS panels** ON, from the cutter's front panel:

  Menu > System setup > Configuration > OPOS parameters > Panels.

  When ON, this option allows the markers to be read in panels; the OPOS sensor reads markers according to panel size, instead of loading them all. When set to ON, the sensor will load only two markers in the X direction when loading OPOS. Other markers will be read when unrolling the substrate.
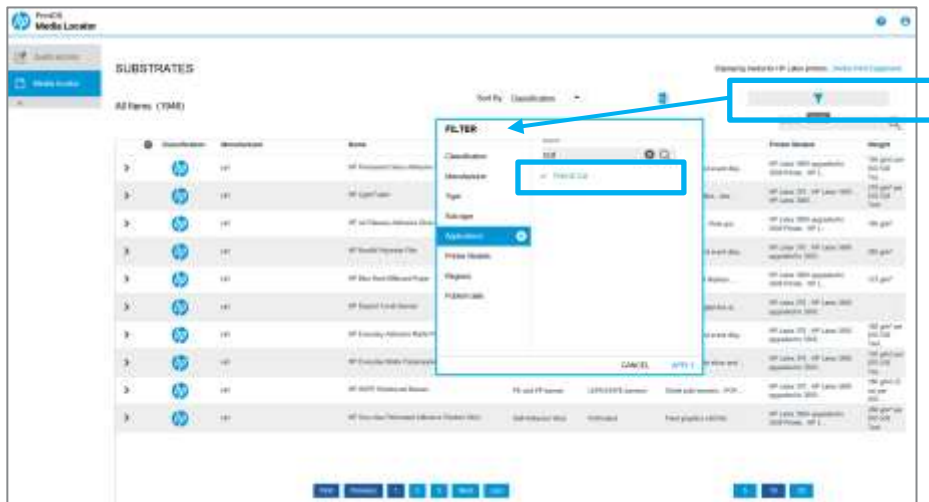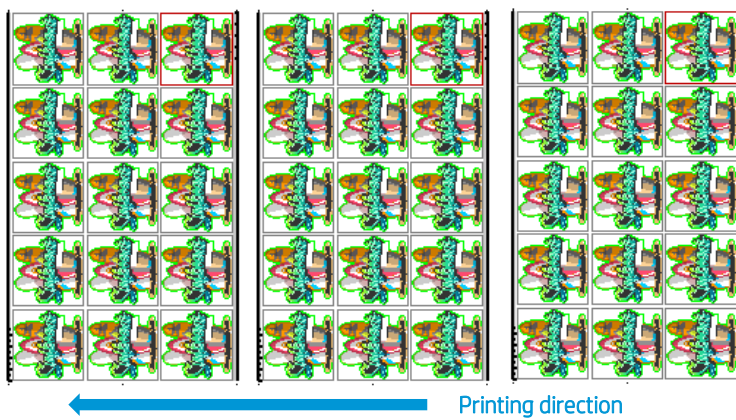
- **Reduce job sizes**, e.g. fewer rows of images, and print several copies of a job; in this manner, more **horizontal bars** will be printed and the OPOS sensor will be able to readjust the alignment.

  Rip and print menu > check Repeat job > Select nº. of copies

Printing direction

- **Reduce the parameter velocity** to 100mm/s; this is the speed at which the cutter will load the OPOS marks. From the cutter's front panel: *Menu > System setup > Settings > Velocity.*

  Set the cutting speed in the **RIP** as required:

- **Add top and bottom margins** to the print&cut job.

  Add 100 mm of **extra top margin (a)** and **extra bottom margin (b)** to the job from the printer front panel: *Menu > Settings > Substrate > Substrate handling options*
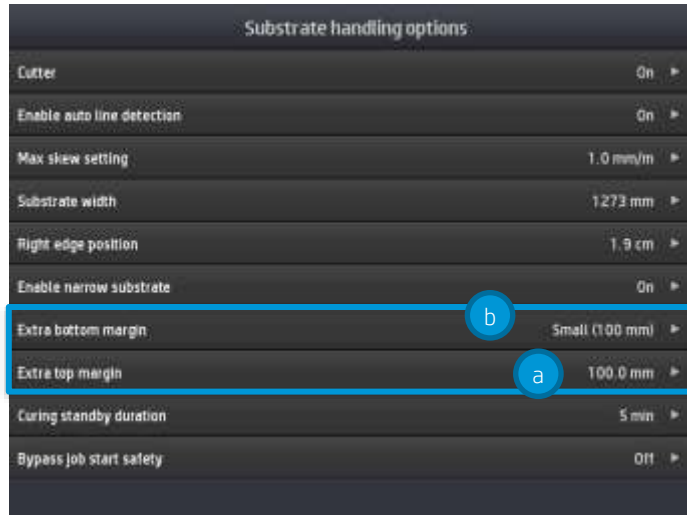
Top and bottom edges of the plot can turn wavy, making it difficult for the OPOS sensor to read the HP barcode correctly and apply an accurate alignment.

With no margins	With margins
Wavy edges	The substrate is flat in the cutting zone.

5.2   Self-adhesive vinyls

According to their manufacturing processes and their chemistry, self-adhesive vinyls are classified as follows:

- Calendered monomeric
- Calendered polymeric
- Cast polymeric

Calendered types are more susceptible to undergoing deformations caused by high temperatures during the printing process. When this happens, the dimensions of the print will change and this will affect cutting accuracy.

We recommend decreasing the curing temperature to 110°C for print modes **8p_6C_100%** and **10p_6C_110%**, especially for **calendered monomeric** and **calendered polymeric** self-adhesive vinyls.

Important: It is possible to go below 110°C but, depending on the media used and image's characteristics, it may require reducing the ink density as well in order to guarantee sufficient **ink curing**.
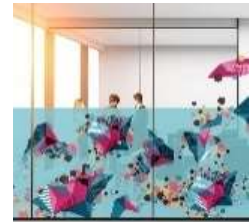
5.3   Transfer media

Find a detailed description and guidance on how to customize your clothing in the following document: Customized Clothing with HP Latex Printers.
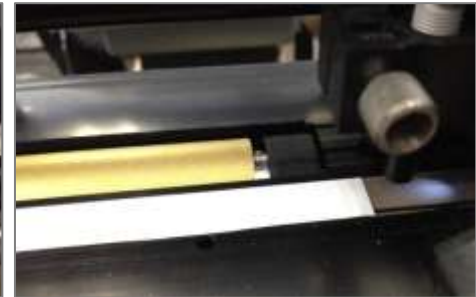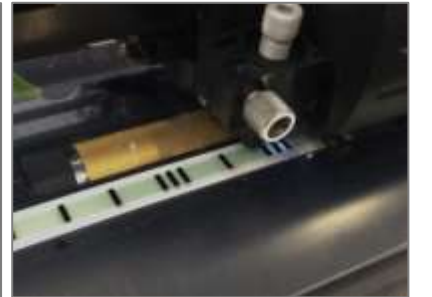
5.4   Transparent / translucent films

It can be difficult for the HP OPOS sensor to read the HP barcode correctly on transparent and translucent substrates.

Use a white background, such as a **white self-adhesive vinyl** to prevent incorrect readings:

Step 1	Step 2	Step 3
Cut a stripe of a white self-adhesive vinyl, of approximately 1cm width, in order to cover the cutting strip.	**Stick the white self-adhesive vinyl** strip over the whole length of the cutting strip.	**Load the substrate**. Now the sensor can read the **HP barcode.**

5.5   Laminates

- With HP Latex printers you can laminate right after printing. Use the overlaminate recommended by the manufacturer of your SAV.

- Cut any part of a laminate film sticking out of the edges of the self-adhesive sheet.

- Avoid the presence of bubbles, especially in the HP barcode and OPOS zones.

5.6   Perforated SAV

The OPOS sensor cannot read the HP barcode correctly on some perforated films due to the nature of the substrate liner, which causes colored areas to have different color density between the vinyl and the liner area (see picture below).

For this reason, neither OPOS XY marks nor HP Barcodes work well.

In order to be able to **cut a job on perforated SAV**, we suggest the following workflow:

1. When preparing the job, select **OPOS** as registration marks or print marks.

HP Flexi Print   Production Manager

Important: Note that, as no barcode is used, you cannot take advantage of this feature (e.g. unattended cutting or bow compensation).

2. Send the job to **Print**.

3. Load the printed job on the cutter.

Cutter front view

Printing direction

Lead printing edge
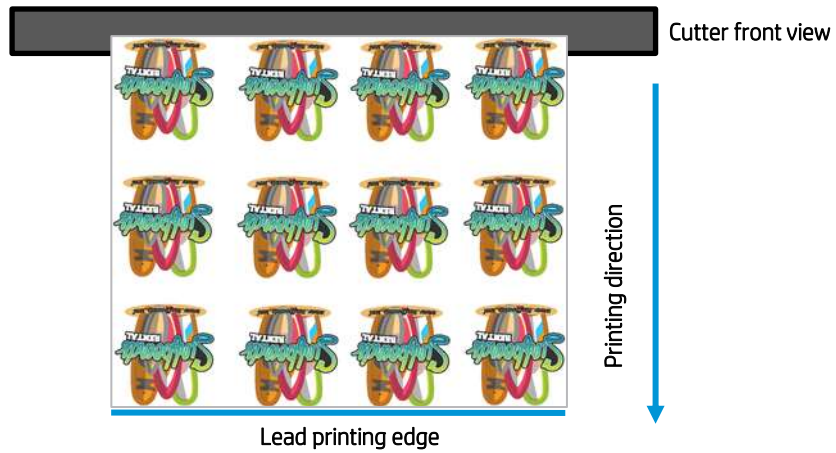
4. As there is no barcode, the cutter will not start cutting right after loading the substrate. Send the job to the cutter from the **HP Production Manager** cutter queue.

5. The cutter front panel will indicate "**set tool above first mark**." Then move the sensor with the arrows to the first OPOS mark and press .

The OPOS sensor will search and read all OPOS marks and start cutting.

Important: Note that, as no barcode is used, each job that has to be cut will have to be sent separately from the **Production Manager** cutter queue.

5.7   Self-adhesive textiles

These materials are used for interior decoration, in-store construction and property design, in gastronomy and hostelry, and in the private sector as well. One example of such materials is Mediatex® WallCover Textile, from Junkers and Müllers (HP latex ink certified).

For **printing** on this material, use the certified substrate preset, found in the printer's online search or from the PrintOS Media Locator website:

https://www.printos.com/ml/#/medialocator

When **cutting**, you can follow the settings below as a starting point to setting the cutting parameters (using the **standard** knife type):

	Kiss cut	Cut through (FlexCut)	
		Full	Half
Knife pressure	190 g		
Velocity	400 mm/s		
Pressure		260 g	150 g
Length		10 mm	0.8 mm
Velocity		Auto	

Check if the result is satisfactory. If not, change any of the above parameters. Reducing the velocity can improve the result. Avoid using cutting speeds greater than **400 mm/s (16 ips) with cutting pressures above 170 g.**

Important: HP Latex Cutter **cannot** cut textiles other than self-adhesive textiles that have a **liner**. For regular soft signage textiles other types of cutters should be used.

5.8   Reflective graphic films

Reflective graphic films offer nighttime and daytime visibility for graphics and advertising. Their uses may include:

- Wraps for vehicles, straight trucks, semi-trucks and semi-trailers

- Smooth and textured wall graphics, indoor and outdoor signs, including point-of-purchase and displays

- Bus graphics

- Small format original equipment manufacturer's (OEM) decorative and identification graphics, cautionary and safety labeling

Important: The following recommendations are limited to flexible, enclosed lens, retroreflective films, not thicker than 0.5mm (0.8mm with optional sandblast blade), and not prismatic reflective films. Check the cutting instructions for your specific graphic material.

- Make sure the material is compatible with HP Latex inks and printers (PrintOS Media Locator)

- From cutter's front panel, select a new **User** to save the new configuration specific for your reflective material: *Menu > User*

- Check and modify accordingly the cutting settings for **kiss-cut** and **cut-through (FlexCut)** (view 4.5.5). Note that some films may require the use of sandblast knife or may not be recommended for cut-through jobs.

- **Very important**: Perform *Cal. Media* calibration (view 4.5.5); this calibrates the reflection levels of the marker color and the substrate color.

6 Tips for lettering

The following tips are extracted from the 3M Instruction Bulletin 4.1.
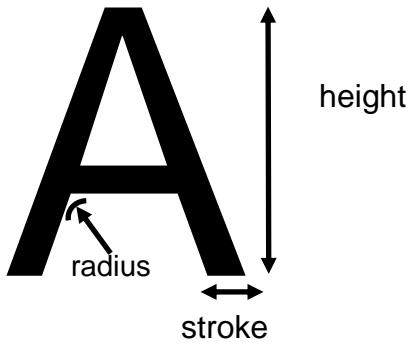
These tips are intended to eliminate problems when:

a) Cutting and weeding.

b) Removing the application tape and film from the liner.

c) Removing the application tape from the film after the letters have been applied to the final surface.

Table 1. Recommended minimum cutting sizes for letters and symbols

Type of film	Type of liner	Type of adhesive	Letter height inch (mm)	Stroke width inch (mm)	Radius inch (mm)
2 mil vinyl film	Synthetic, heavy weight	-	0.25 (6.35)	0.04 (1.02)	0.024 (0.61)
	Paper	-	0.375 (9.52)	0.04 (1.02)	0.024 (0.61)
	Polycoated	-	0.5 (12.7)	0.05 (1.27)	0.024 (0.61)
	Polycoated	Repositionable	3.0 (76.20)	0.25 (6.35)	0.125 (3.18)
	Polycoated	Air-release channels	3.0 (76.20) *flat-bed dual edge blade* 6.0 (152.40) *friction-fed cutter*	0.25 (6.35)	0.125 (3.18)
4 mil vinyl film	Polycoated	-	0.5 (12.7)	0.09 (2.29)	0.050 (1.27)
	Polycoated	Repositionable	3.0 (76.20)	0.25 (6.35)	0.125 (3.18)
	Polycoated	Air-release channels	3.0 (76.20)	0.25 (6.35)	0.125 (3.18)
	Paper	-	0.5 (12.7)	0.25 (6.35)	0.125 (3.18)

Vinyl film with sidewalk or floor overlaminate	Polycoated	–	Not recommended for letters or symbols		
Non-PVC	Polycoated	Air-release channels	3.0 (76.20)	0.38 (9.52)	0.063 (1.60)
Polyolefin film	Polycoated	–	Not recommended for letters or symbols		
Enclosed lens retroreflective film	Polycoated	–	3.0 (76.20)	0.38 (9.52)	0.063 (1.60)
Enclosed lens retroreflective film	Polycoated	–	1.0 (25.40)	0.38 (9.52)	0.063 (1.60)
Enclosed lens retroreflective film	Polycoated	Slideable	1.0 (25.40)	0.38 (9.52)	0.063 (1.60)
Enclosed lens retroreflective film	Polycoated	Air-release channels	1.0 (25.40)	0.38 (9.52)	0.063 (1.60)

7   Useful links

Product documentation:

- http://www.hp.com/go/latex115printandcut/
- http://www.hp.com/go/latex315printandcut/
- http://www.hp.com/go/latex335printandcut/

User manuals:

- http://www.hp.com/go/latex300/manuals/
- HP Latex cutter

Print and Cut training:

- https://hplatexknowledgecenter.com/printers/hp-latex-115-pc/blog/hp-latex-cutter-series-training

Print and Cut videos:

- Print and Cut Solution
- Customizable clothing
- Floor graphics
- Window graphics

Further information:

- http://www.hp.com/supportvideos
- http://www.youtube.com/HPSupportAdvanced