HP Latex R1000/R2000 Printer Series

User Guide

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Edition 2

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Read and follow the operating and safety instructions before starting the printer.

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1 Introduction

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- Printer accessories and consumables
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- Main components
- Printer software
- Turn on the printer for the first time
- Turn the printer on and off
- Move the printer

Welcome to your printer

You can use your printer to print signs and graphics on a wide range of materials up to 1.63 m (64 in) or 2.50 m (98 in) wide; it uses water-based HP Latex Inks to provide high-quality, durable output.

Sharpen the quality of any rigid substrate with the most vibrant colors and glossiest white

- The HP Latex R1000 is designed to absorb peaks without compromising quality.
- The HP Latex R2000 is designed for sustained production environments.

Achieve amazing colors on both rigid and flexible

- Get all of the print quality and none of the smell with the strong, vibrant HP Latex color gamut on rigid, odorless prints, and a thin ink layer that preserves the gloss and feel of the substrate.
- Achieve the same look across rigid and flexible campaigns using one technology and say goodbye to print and mount.
- Durable and flexible water-based ink provides high adhesion and outstanding scratch resistance with a new HP Latex Overcoat fluid.

Expand your offering with the glossiest white

- Deliver the glossiest white on transparent and colored substrates with high-opacity white HP Latex Ink that resists yellowing over time.
- No waste between white jobs with removable HP Thermal Inkjet printheads stored in the offline rotating chamber.
- White ink automatic maintenance makes white like any other color with automatic recirculation, automatic nozzle checks, and simple workflows.

Increase your productivity with smarter printing

- Respond to peaks with high-speed quality, with an efficient workflow thanks to continuous loading and unattended flexible printing.
- Advanced engineering can simplify your workflow and reduce reprints with the help of automatic maintenance, assisted loading workflows and a smart vacuum system, automatic image quality corrections, and unattended flexible printing.
- Increase uptime with this smart printer.

Printer accessories and consumables

	HP Latex R1000 (64 in) and R2000 (98 in)
Supplied with the printer	HP Latex R Series Standard Tables
	HP Latex R Series Multi-Sheet (N-up) Kit
Optional accessories	HP Latex R Series White Upgrade Kit[1,2]
	HP Latex Roll Printing Kit[1,2]
	HP Latex R Series Edge Holders Kit
	HP Latex R Series Extension Tables[1]
Consumables	HP Latex 872/882/886 Printheads
	HP Latex 872/882/886 Ink Cartridges

HP Latex R1000 (64 in) and R2000 (98 in)
HP Latex 872/882/886 Maintenance Cartridge

[1] Depending on your country, there may be bundled configurations of accessories with the printer.
[2] Depending on your printer model, this item may be preinstalled or available as an optional accessory.

Documentation and useful links

The following documents are available for your printer, and can be downloaded from http://www.hp.com/go/latexR1000/manuals or http://www.hp.com/go/latexR2000/manuals, depending on your printer model:

- Site preparation guide and checklist
- Installation guide
- Introductory information
- User guide
- Legal information
- Limited warranty

Further information is available from http://www.hp.com/go/latexR1000/support or http://www.hp.com/go/latexR2000/support.

Videos and other training materials are available from:

- http://www.hp.com/supportvideos
- http://www.youtube.com/HPPrinterSupport
- http://www.hp.com/go/latexR1000/training or http://www.hp.com/go/latexR2000/training

See the Solutions website for information about new substrates, at http://www.hp.com/go/latexR1000/solutions/ or http://www.hp.com/go/latexR2000/solutions/. A Web-based Media Locator (https://www.printos.com/ml/#/medialocator) has been developed to collect available substrate configurations for latex printers.

The Quick Response (QR) code images found in some parts of this guide provide links to additional video explanations of particular topics. For example, see Load rigid substrate on page 46.

Safety precautions

Before using your printer, read the following safety precautions (in addition to the operating instructions in this user guide) to make sure you use the equipment safely.

You are expected to have the appropriate technical training and experience necessary to be aware of hazards to which you may be exposed in performing a task, and to take appropriate measures to minimize the risks to yourself and to others.

Operations must be supervised at all times.

General safety guidelines

⚠ WARNING! The information provided by the printer status light is only for functional information purposes and is not related to any safety provision or safety states. Warning labels on the printer must be always considered when operating the printer and prevail against any status indicated by the printer status lights.

⚠ WARNING! The printer's Internal Print Server can be controlled from two different touchscreens. Never operate the printer using both touchscreens at the same time. Ensure that no-one else is engaged in printer operation or maintenance before launching any command on either touchscreen.

- Turn off the printer, using the Branch Circuit Breakers located in the building's Power Distribution Unit (PDU), and call your service representative in any of the following cases:
  - The power cord is damaged.
  - The drying or curing enclosures are damaged.
  - The printer has been damaged by an impact.
  - Liquid has entered the printer.
  - There is smoke or an unusual smell coming from the printer.
  - The printer's built-in Residual Current Circuit Breaker (Ground Fault Circuit Interrupter) has been repeatedly tripped.
  - Fuses have blown.
  - The printer is not operating normally.
  - There is any mechanical or enclosure damage.
- Turn off the printer using the Branch Circuit Breakers in either of the following cases:
  - During a thunderstorm
  - During a power failure
- Take special care with zones marked with warning labels.

There are no operator-serviceable parts inside the printer except those covered by HP's Customer Self Repair program (see http://www.hp.com/go/selfrepair). Refer servicing of other parts to qualified service personnel.

Important operating notes

⚠ WARNING! Never leave the printer without supervision when the power switch is turned on.

⚠ CAUTION: Automatic white-ink system maintenance cannot occur when the printer is completely powered down. If the printer will be unused for a long period of time (more than 4 hours), leave only the white-ink switch turned on, and follow the instructions in this guide about power on/off modes: see Turn the printer on and off on page 18.

Electrical shock hazard

⚠ WARNING! The internal circuits and drying and curing modules operate at hazardous voltages capable of causing death or serious personal injury.

Turn off the printer using the Branch Circuit Breakers located in the building's Power Distribution Unit (PDU) before servicing the printer. The printer must be connected to earth at mains outlets only.

To avoid the risk of electric shock:

- Do not attempt to dismantle the drying and curing modules or power box during hardware maintenance tasks. In that case, follow the instructions strictly.
- Do not remove or open any other closed system covers or plugs.

- Do not insert objects through slots in the printer.
- Test the functionality of the Residual Circuit Breaker (RCCB) every year (refer to the procedure below).

NOTE: A blown fuse may indicate malfunctioning electrical circuits within the system. Call your service representative, and do not attempt to replace the fuse yourself.

Checking the functionality of the Residual Circuit Breakers (RCCBs)

Following standard Residual Current Circuit Breaker (RCCB) recommendations, it is recommended that the RCCBs are tested on a yearly basis. The procedure is as follows:

1. Turn off the built-in computer using the Internal Print Server's **Shutdown** button. Do not turn off the printer from the mains switch or the circuit breakers.

   CAUTION: The shutdown process takes some time to complete. Wait until the green Power Enabled light is off before proceeding.

2. Once the computer is off, test that the RCCB works correctly by pressing the test button.
   - If the RCCB does not trip when the test button is pressed, this indicates that it has failed. The RCCB must be replaced for safety reasons; call your service representative to remove and replace the RCCB.
   - If the RCCB trips, this indicates it is working correctly; reset the RCCB to its normal on state.

Heat hazard

The drying and curing subsystems of the printer operate at high temperatures and can cause burns if touched. LED's array supports, beam and enclosures can reach high temperatures. To avoid the risk of burns, take the following precautions:

- Use personal protective equipment to manipulate substrate in the output area when the warning sign for high-temperature print modes appears in the Internal Print Server. Ensure that equipment is according to local laws for all materials at temperatures up to 100°C.
- Do not touch the internal enclosures of the printer's drying and curing modules.
- Take special care when accessing the substrate path.
- Take special care with zones marked with warning labels.
- Do not place objects covering the LED array supports, beam, or enclosures.
- Do not attempt to modify the LED array supports, beam, or enclosures.
- Remember to let the printer cool down before performing some maintenance operations.
- Ensure that the printer has cooled down before mounting or disassembling the substrate edge holders.

Fire hazard

The drying and curing subsystems of the printer operate at high temperatures. Call your service representative if the printer's built-in Residual Current Circuit Breaker (Ground Fault Circuit Interrupter) is repeatedly tripped.

To avoid the risk of fire, take the following precautions:

- Use the power supply voltage specified on the nameplate.
- Connect the power cords to dedicated lines, each protected by a branch circuit breaker according to the information detailed in the site preparation guide.
- Do not insert objects through slots in the printer.

- Take care not to spill liquid on the printer. After cleaning, make sure all components are dry before using the printer again.
- Do not use aerosol products that contain flammable gases inside or around the printer. Do not operate the printer in an explosive atmosphere.
- Do not block or cover the openings of the printer.
- Do not attempt to modify the drying or curing module, or the power box.
- Ensure that the operating temperature of the substrate recommended by the manufacturer is not exceeded. If this information is not available, ask the manufacturer. Do not load substrates that cannot be used at an operating temperature above 125°C (257°F).
- Do not load substrates with auto-ignition temperatures below 250°C (482°F). See note below. No ignition sources are close to the substrate.

NOTE: Test method based on EN ISO 6942:2002: *Evaluation of materials and material assemblies when exposed to a source of radiant heat, method B.* The test conditions, to determine the temperature when the substrate starts ignition (either flame or glow) were: Heat flux density: 30 kW/m², Copper calorimeter, K type thermocouple.

- Proper maintenance and genuine HP consumables are required to ensure that the printer operates safely as designed. The use of non-HP consumables (foams, filters, printhead cleaning roll, and inks) may present a risk of fire.

The LED array supports, beam, and enclosures can reach high temperatures. To avoid the risk of fire, take the following precautions:

- Take special care with zones marked with warning labels.
- Take care not to spill liquid on the accessory. After cleaning, make sure all components are dry before using the printer.
- Do not place objects covering the LED array supports, beam, or enclosures.
- Do not attempt to modify the LED array supports, beam, or enclosures.

Mechanical hazard

The printer has moving parts that could cause injury. To avoid personal injury, take the following precautions when working close to the printer:

- Keep your clothing and all parts of your body away from the printer's moving parts.
- Avoid wearing necklaces, bracelets, and other hanging objects.
- If your hair is long, try to secure it so that it will not fall into the printer.
- Take care that sleeves or gloves do not get caught in the printer's moving parts.
- Avoid standing close to the fans, which could cause injury and could also affect print quality (by obstructing the air flow).
- Do not touch gears, belt, beams, or moving rolls during printing.
- Do not operate the printer with covers bypassed.
- Do not touch alignment or lateral bars during printing.
- Use personal protective equipment to manipulate rigid substrates and/or the substrate edge holders.

⚠ WARNING! Take care when loading or collecting substrate, and never put your hands below the alignment bar, drying beam, or curing modules after giving the command to print. Those parts may move and adjust automatically and can cause you serious injuries.

- Ensure that the alignment bar is well positioned at its topmost position and is not moving at all, before mounting the alignment-bar extension. There is a risk of trapping your fingers between the gaps.
- For the roll-to-roll accessory: Take care when using the air gun. When used for cleaning purposes, make sure to use it according to local regulations: additional safety provisions may apply.

Light radiation hazard

UV radiation can be emitted from the LED array in compliance with the requirements of the exempt group of IEC 62471:2006: *Photobiological safety of lamps and lamp systems*. However, you are recommended not to look directly for a long time at the output LEDs while they are on. Optical barriers are used to determine the presence of obstacles in substrate input/output areas. Do not stare at the light beam, which could be harmful to the eyes.

Sound pressure level

The sound pressure level could exceed 70 dB(A) in some print modes. Hearing protection may be required.

Chemical hazard

See the safety data sheets available at http://www.hp.com/go/msds to identify the chemical ingredients of your consumables (material and agents). Sufficient ventilation needs to be provided to ensure that potential airborne exposure to these substances is adequately controlled. Consult your usual air conditioning or EHS specialist for advice on the appropriate measures for your location.

Heavy substrate hazard

Special care must be taken to avoid personal injury when handling heavy substrates:

- Handling heavy substrate sheets, pieces, or rolls always requires two people. Care must be taken to avoid back strain and/or injury.
- Always use a forklift, pallet truck, or other handling equipment to lift substrates. The printer has been designed to be compatible with many of these devices.
- Always wear personal protective equipment including boots and gloves.

Ink and condensates handling

HP recommends that you wear gloves when handling ink and condensate system components.

Ventilation

Fresh air ventilation is needed to maintain comfort levels. For a more prescriptive approach to adequate ventilation, see the latest edition of the ANSI/ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) document *Ventilation for Acceptable Indoor Air Quality*.

Air conditioning and ventilation should meet local environmental, health, and safety (EHS) guidelines and regulations.

Follow the ventilation recommendations in the site preparation guide.

NOTE: The ventilation units should not blow air directly onto the printer.

Air conditioning

As with all equipment installations, to maintain ambient comfort levels, air conditioning in the work area should take into account that the equipment produces heat. Typically, the printer's power dissipation is:

- 9 kW (30.7 kBTU/h) for the HP Latex R1000
- 11 kW (37.5 kBTU/h) for the HP Latex R2000

Air conditioning should meet local environmental, health, and safety (EHS) guidelines and regulations.

NOTE: The air conditioning units should not blow air directly onto the printer.

Use of tools and keys

- **Users:** Daily operations including printer settings, printing, substrate loading, replacement of ink reservoirs, and daily checks. Do not require any tool or maintenance key.
- **Maintenance personnel:** Hardware maintenance tasks and replacement of printheads, filters, ink waste bottles, foams, and printhead cleaning roll. Require maintenance key, and flat screwdriver.
- **Service personnel:** Any repair or maintenance operation, running diagnostics, and troubleshooting. Require maintenance key, power-box key, mains switch key, internal print server key, e-box/white switch key, and Torx screwdriver set.

Maintenance key

Power-box key

Three keys: main switch key, Internal Print Server switch key, and e-box/white switch key

Torx screwdriver set

NOTE: During the installation of the printer, the designated personnel receive training for the safe operation and maintenance of the printer. It is not allowed to use the printer without this training.

NOTE: After using the maintenance key to open a door, remember to lock it afterwards, and return the key to safe and secure storage.

Warnings and cautions

The following symbols are used in this manual to ensure the proper use of the printer and to prevent the printer from being damaged. Follow the instructions marked with these symbols.

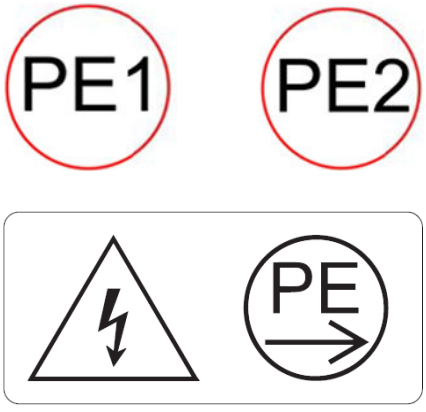
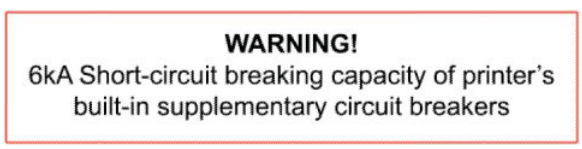
⚠ WARNING! Failure to follow the guidelines marked with this symbol could result in serious personal injury or death.

⚠ CAUTION: Failure to follow the guidelines marked with this symbol could result in minor personal injury or damage to the product.

Warning labels

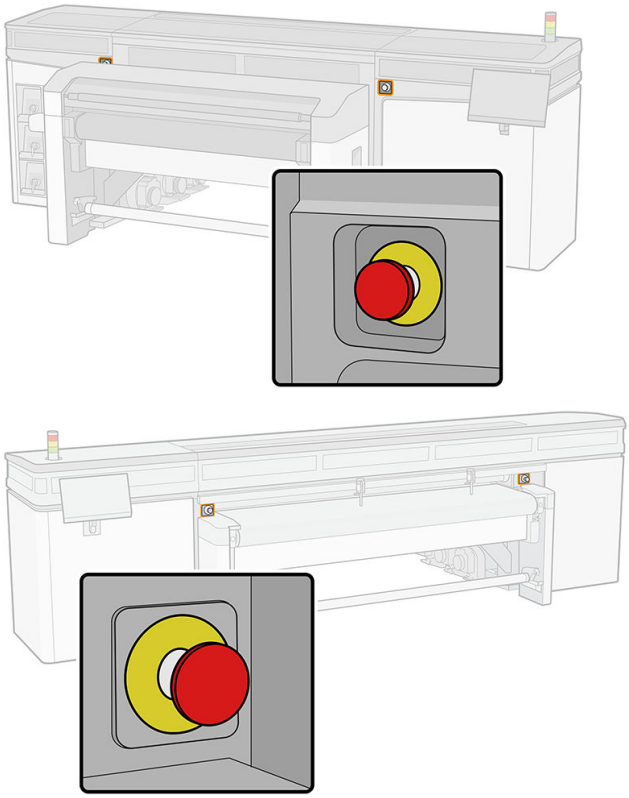
Label	Explanation
 Located on the power box	**Electric shock hazard** Heating modules operate at hazardous voltage. Disconnect power source before servicing. Caution! Double pole. Neutral fusing. Refer servicing to qualified service personnel. In case of operation of the fuse, parts of the printer that remain energized may represent a hazard during servicing. Turn off the printer using both Branch Circuit Breakers located in the building's Power Distribution Unit (PDU) before servicing. **Warning** High leakage current. Current leakage may exceed 3.5 mA. Earth connection essential before connecting supply. Equipment to be connected to earthed mains only. See installation instructions before connecting to the supply. Ensure that the input voltage is within the printer's rated voltage range. The printer requires up to two dedicated lines, each protected by a branch circuit breaker according to site preparation requirements. Read and follow the operating and safety instructions before starting the printer.
 Located on the curing modules and edge holders, and seen in the Internal Print Server when high-temperature print modes are used	Risk of burns. Do not touch the internal enclosures of the printer's drying and curing modules. Do not touch the LED array and enclosures when accessing the substrate path.
 Located on each side of the substrate path, close to the scan-axis beam motor gear and curing module motor gears, and to the right of the top cover	Crush hazard. Do not touch the scan-axis beam motor gear, drying beam, or curing module while moving. When substrate has been loaded, the carriage and curing subsystem descend into their normal position, and could crush your hand or anything else left underneath it. Watch your hand when closing curing modules.

Label	Explanation
 Located on each side of the substrate path, and close to the PPS gear	Risk of trapped fingers. Do not touch gears, rollers, or belt while moving. Danger that your hands may become trapped between gearwheels.
 Located internally on the carriage front and side, and beside the printhead cleaning roll; for maintenance/service personnel only	Hazardous moving part. Keep away from moving carriage. When printing, the printhead carriage travels back and forth across the substrate.
 Located on the waste bottle and beside the printhead cleaning roll, and seen in the Internal Print Server when high-temperature print modes are used	You are recommended to wear gloves when handling ink cartridges, printhead cleaning cartridges, the printhead cleaning container, and the waste bottle. Use personal protective equipment when manipulating rigid substrates. Ensure that equipment is according to local laws for heat hazards covering up to 100°C on all substrates.
 Located on the rear of the left cover	Sound pressure level could exceed 70dB(A) in certain print modes. Hearing protection may be required.
 Located in the substrate input and output areas, close to the optical barrier emitters (optional)	Light radiation. Do not stare at the light beam, which may be harmful to the eyes.

Label	Explanation
 Located internally on heating modules and electrical cabinets; for maintenance/service personnel only	Electric shock hazard. Disconnect power before servicing. Heating modules and electrical cabinets operate at hazardous voltage.
 Located internally, close to vacuum fan blades and Dryer and Curing PCA's cooling fan; for maintenance/service personnel only	Hazardous moving parts. Keep away from moving fan blades.
 Located close to the carriage encoder strip, the top cover spring, and the top right corner of the top cover	Risk of cutting your fingers. Do not touch the carriage encoder strip while accessing the substrate path. Watch your fingers when closing the service window and other maintenance covers. Use personal protective equipment when manipulating rigid substrates.
	Identifies the Protective Earth (PE) terminal for qualified electricians, and bonding terminals for maintenance/service personnel only. Earth connection essential before connecting supply.
	Identifies the Protective Earth (PE) terminal for qualified electricians, and for maintenance/service personnel only. Earth connection essential before connecting supply.
	Identifies the short-circuit breaking capacity of the printer's built-in supplementary circuit breakers, beside the mains input terminal, for qualified electricians and maintenance/service personnel only. Earth connection essential before connecting supply.

Emergency stop buttons

There are four emergency stop buttons distributed around the printer. If an emergency occurs, simply push one of the emergency stop buttons to stop all printing processes. A system error message is displayed, and the fans turn at maximum speed. Ensure that all emergency stop buttons are released before restarting the printer.

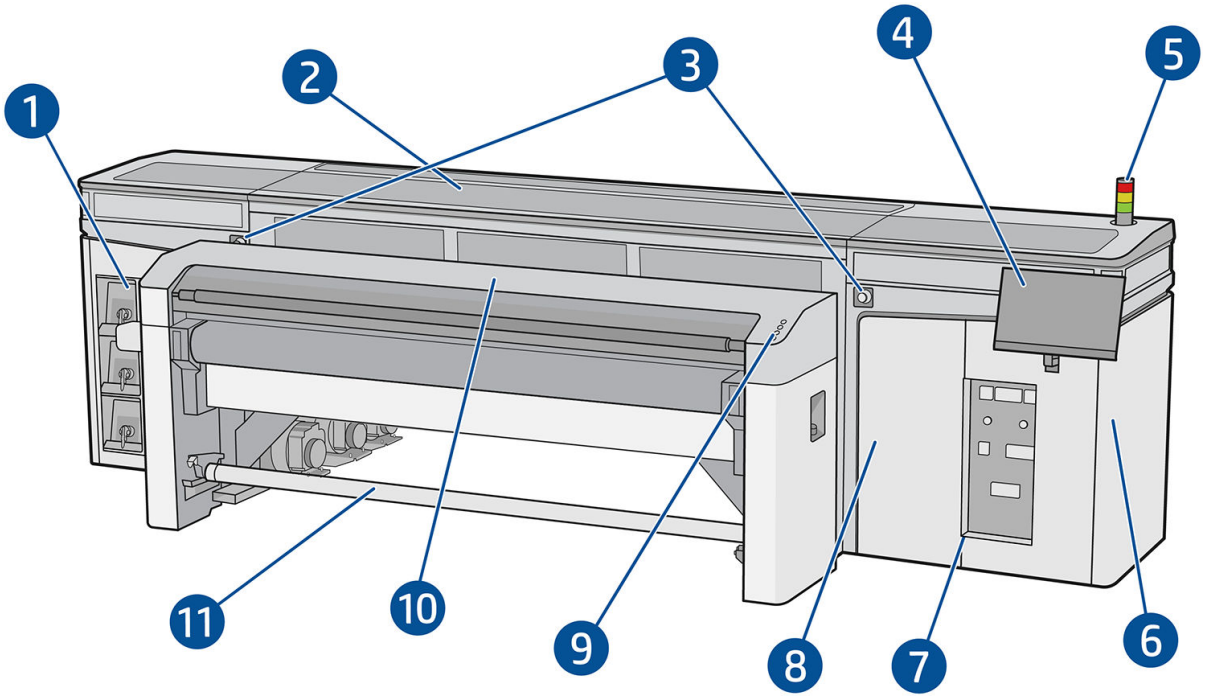


For safety reasons, access to the print zone is not permitted while printing is in progress. Therefore, if the top cover or the carriage cover is opened, power to the carriage and to the drying and curing module is disconnected. The print is canceled and a system error may be displayed.

Main components

The following views of the printer illustrate the main components.

Front view

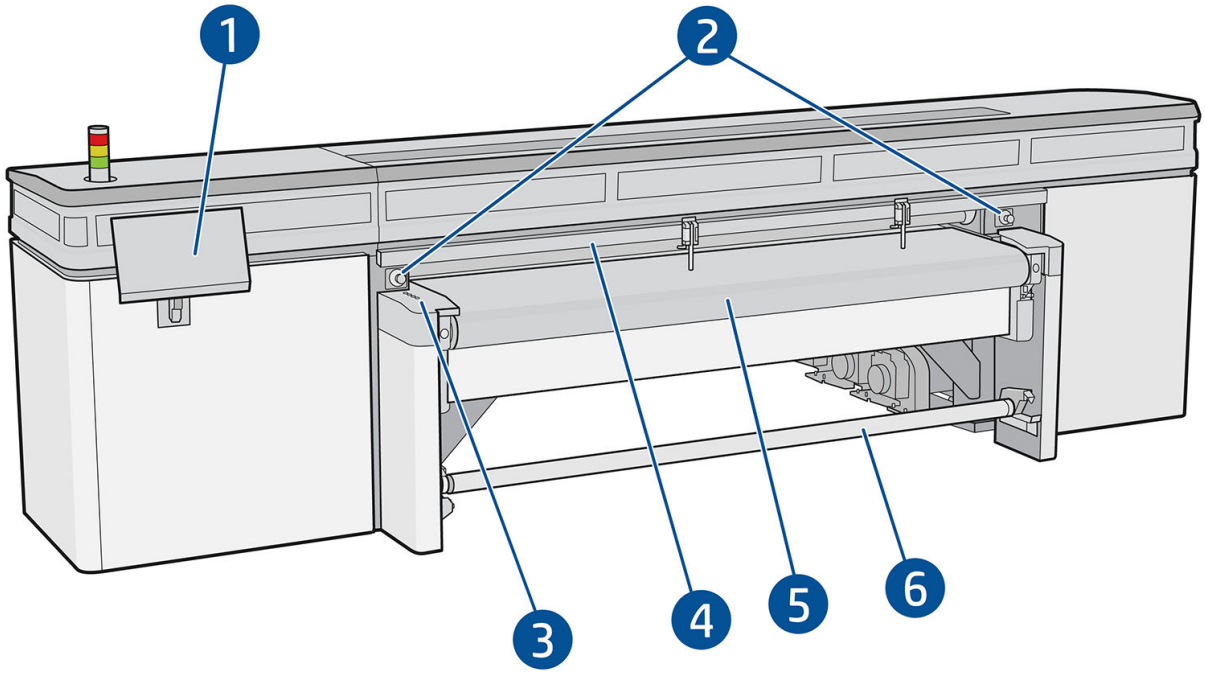


1. Ink cartridges
2. Top cover for print-zone access
3. Emergency stop buttons
4. Touchscreen 1 (to access the Internal Print Server)

   ⚠ WARNING! The printer should be controlled by one person using only one touchscreen. Do not try to use both touchscreens at once.

5. Printer status beacon
6. Power box
7. Power switches, lights, and circuit breakers
8. Printhead cleaning roll door
9. Quick-access buttons
10. Curing module
11. Substrate output spindle (when accessory is installed)

Rear view

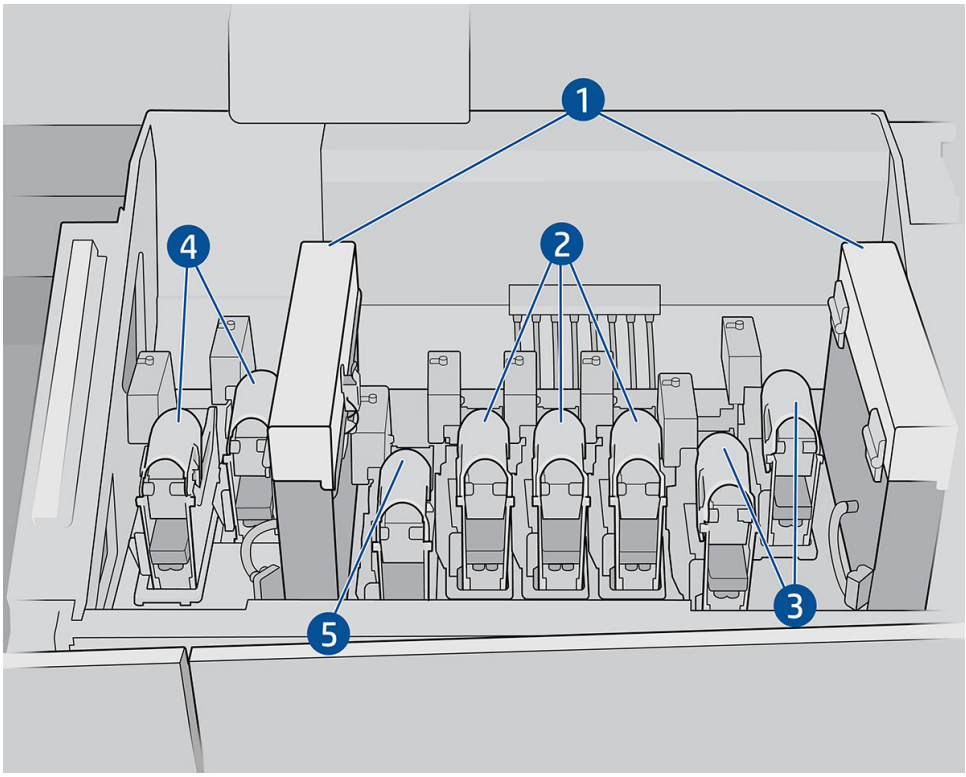


1. Touchscreen 2 (to access the Internal Print Server)

   WARNING! The printer should be controlled by one person using only one touchscreen. Do not try to use both touchscreens at once.

2. Emergency stop buttons
3. Quick-access buttons
4. Alignment bar
5. Substrate-advance belt
6. Substrate input spindle (when accessory is installed)

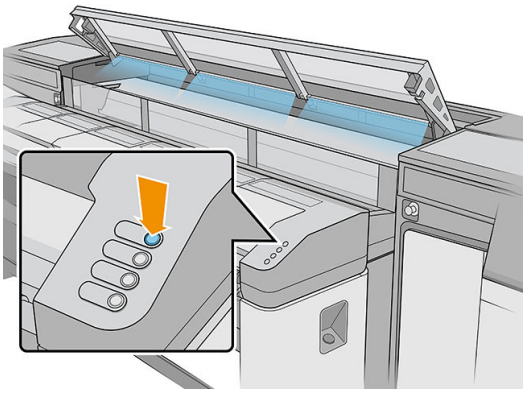
Carriage view



In the carriage you can see the eight printhead latches, under which are the printheads.

1. Aerosol filters
2. Color printhead latch
3. White printhead latch
4. Optimizer printhead latch
5. Overcoat printhead latch

Platen light



The platen light illuminates both the substrate-advance belt and the job that is being printed. It can be switched on and off manually.

Printer status beacon

⚠ CAUTION: The information provided by the printer status beacon is for functional information purposes only, and is not related to any safety provision, or safety states. Warning labels on the printer must be always considered when operating the printer, and they prevail over any status indicated by the printer status beacon.

Printer status beacon lights have the following meanings:

Color	Meaning	Light status	Examples
Red	Printing job has been unexpectedly interrupted	Steady: Printer is stopped	System error while printing Out of substrate while printing
		Flashing: Not possible	
Orange	User intervention is needed	Steady: Printer is stopped	Out of ink
		Flashing: Printer is printing	Water tank level low Recirculation mode disabled
Green	Printer idle or printing	Steady: Printer is idle	Printer working normally
		Flashing: Printer is printing	

Extension tables

The printer comes with standard tables for rigid substrate handling: one for the input side of the printer, and one for the output side. These tables are assembled, installed, and leveled when the printer is installed. They are designed to be used only with the table top horizontal and latched to the printer.

An extra pair of extension tables can be purchased as an accessory. For more information, see Extension tables on page 287.

Quick-access buttons

These buttons are provided on the input side to handle the substrate being loaded into the printer.

- moves the substrate forwards.
- moves the substrate backwards.
- raises the scan beam, alignment bar, and curing module to their highest position.
- tells the printer that the substrate is ready for printing.

The first three buttons are also provided on the output side, with a fourth button to switch on a light over the print zone. A pedal on the floor can be used to tell the printer that the substrate is ready for printing.

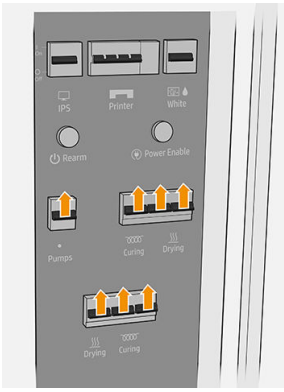
Printer software

Your printer requires the following software:

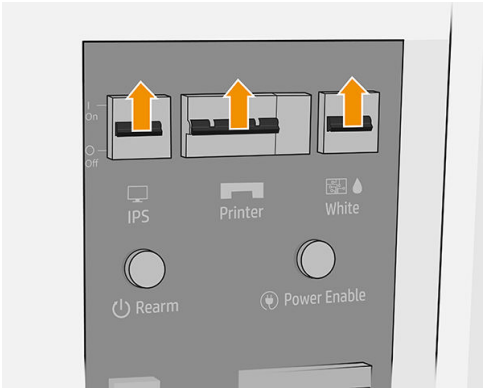
- The HP Internal Print Server is provided with your printer and is already installed. It displays printer alerts on the printer's touch screens, and a summary of printer status; it manages print jobs, and must be used to interact with the printer in various ways. See HP Internal Print Server on page 20.
- A Raster Image Processor (RIP) should be run on a separate computer; it cannot be installed on the printer's built-in computer. It is not provided with the printer and should be obtained separately. The printer is JDF-enabled. If your RIP supports this interface, it can retrieve and display printer and job status.

Turn on the printer for the first time

1. Make sure that the two bottom rows of circuit breakers at the front right of the printer are all in the up position.



2. Turn the main switch to the on position, and also turn on the Internal Print Server and e-box switches beside it.



3. Check that all three green lights are on. In normal operation these lights should always be on. If any of them are off, check the Internal Print Server in case there is a system error, and check with your electrician.
4. Wait for the Internal Print Server to tell you that the printer is waiting for rearm.
5. Perform a visual check of the printer.
6. Press the blue rearm button at the front right of the printer. This enables all of the printer's high-power subsystems.
7. Check that the printer-enabled green light turns on. In normal operation this light should always be on.
8. Wait for the Internal Print Server to indicate that the printer is ready. This can take several minutes. When initialization is complete, the Internal Print Server displays a Ready message.

Turn the printer on and off

The printer has four power levels, which you can access by tapping the icon displayed by the Internal Print Server.

Power levels

1. **Start in normal mode.** The printer is on.
2. **Shut down.** The printer is off.

⚠ CAUTION: The white-ink printheads cannnot survive at this level for more than 4 hours.

3. **Switch to diagnostic mode.** Mode used by the operator or the service engineer. At this level, you can perform maintenance and diagnostic operations, blocking high-voltage lines for safety when manipulating internal parts of the printer.
4. **Switch to low power mode.** Low power mode preserves the white ink channel; see White printhead maintenance wheel on page 274. After restarting in low power mode, you should turn off the e-box switches.

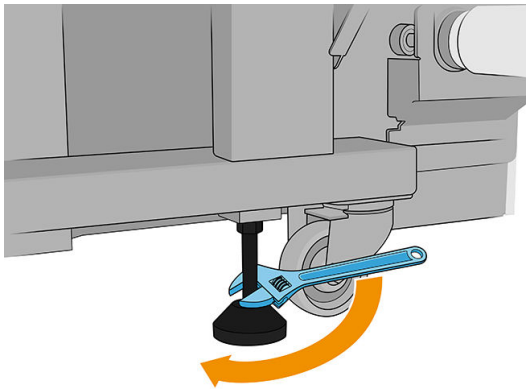
Move the printer

If you wish to move the printer a short distance on the same site, across a horizontal floor with no steps and no slopes of more than 3% inclination, see the following instructions. For more difficult movement operations, call your service representative.

⚠ CAUTION: Slopes steeper than 3% may cause serious damage to the printer.

1. Turn off the printer.
2. Disconnect all power and network cables from the printer.
3. Raise the feet gradually, applying two turns each time to each foot so that the wheels (A) touch the ground. To raise a foot:
   a. Use a 24 mm (15/16 in) open end wrench to unlock the nut at the top of the foot.

b. Rotate the nut manually down the bolt. Leave about 2 cm (0.8 in) clearance at the bottom between nut and foot.

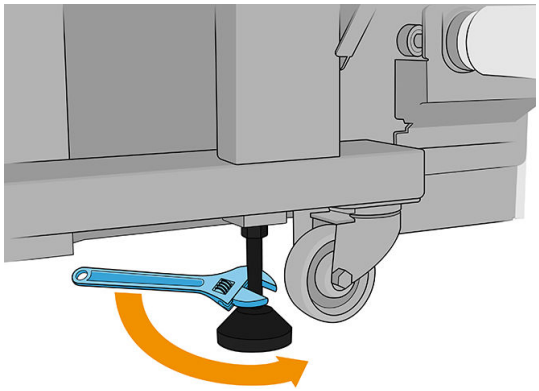


c. Use a 13 mm (1/2 in) open end wrench to rotate the foot upwards. Use the flat hexagonal faces at the bottom of the bolt to fit the wrench.

d. Raise the foot as far as the bolt allows.

e. Use the 24 mm (15/16 in) open end wrench to lock the nut again.

⚠ CAUTION: Take care to raise the feet as high as you can. They may break if they touch the ground while the printer is in motion.



4. Push the printer from the outside corners of the main body. Remember to avoid slopes steeper than 3%.

5. Once the desired destination is reached, reverse the process described above to secure the printer in position.

After moving the printer, you may in some cases need an electrician to reconnect the power cables. You may also need to reconfigure the network, from the printer's built-in computer and from the RIP computer. See the *Installation Guide* for more details, including the minimum space required around the printer.

2 HP Internal Print Server

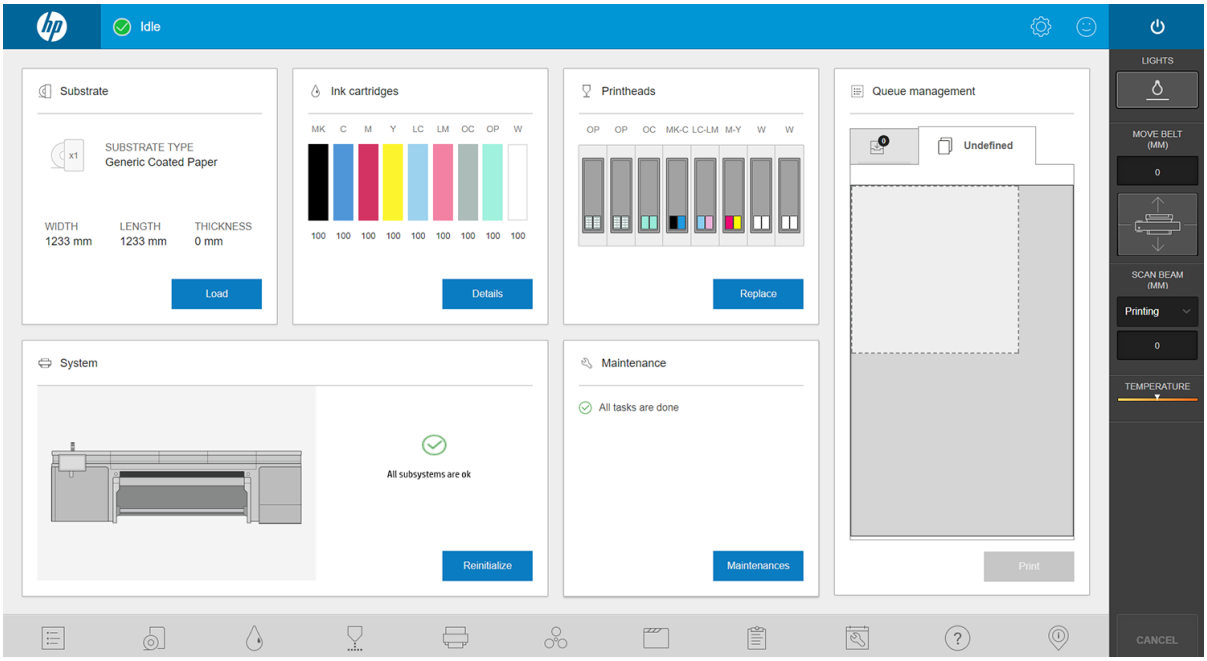
- Start the Internal Print Server
- Internal Print Server widgets
- Printer status and alerts
- Update the firmware and the Internal Print Server
- Internal Print Server settings and preferences

Start the Internal Print Server

The Internal Print Server starts automatically with Windows on the printer's built-in computer, and runs continually, in the background if not in the foreground.

It is displayed on a touchscreen, so you must use it by tapping or swiping items on the screen.

When it starts, the main window appears.



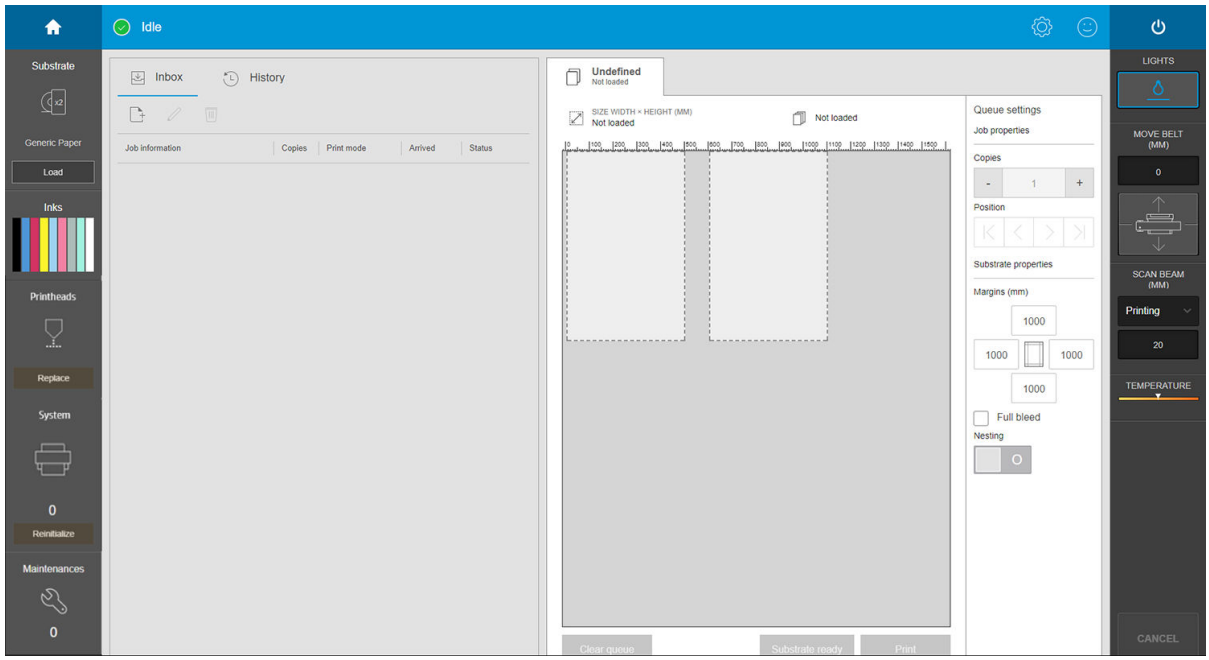
The main window is divided between different widgets, with which you can view and manage the operation of the printer:

- Information about printer supplies: substrate, inks, and printheads
- Information about printer subsystems
- Information about printer maintenance
- Information about the print queue, including the print preview and **Print** button.

You can tap any widget for further information.

From the app bar at the bottom of the window, you can check and configure the printer applications.

Tap the queue management widget to reach the queue management window.



- Most of the left half of the window is occupied by the Inbox tab or the History tab. The Inbox shows jobs that are waiting to be printed, and the History shows jobs that have been printed. The jobs in the Inbox are organized according to the substrate on which they will be printed. After printing, each job moves from the Inbox to the History.

  In this section, you can tap a job to see more information about it. The jobs are organized according to the substrate on which they will be printed.

  To start a queue, move a job to the right.

- Most of the right half of the window is occupied by the preview and settings of the selected job.

- The vertical bars on each side of the window provide further information and action buttons: the same buttons that exist on the printer, but with more options.

- In the **History** tab, you will find accounting information about the jobs that you have recently printed. For complete accounting we recommend registering your machine in PrintOS, where you can find much more complete statistical data, as well as the possibility of downloading them for processing with other software.

Internal Print Server widgets

The Internal Print Server provides the following widgets:

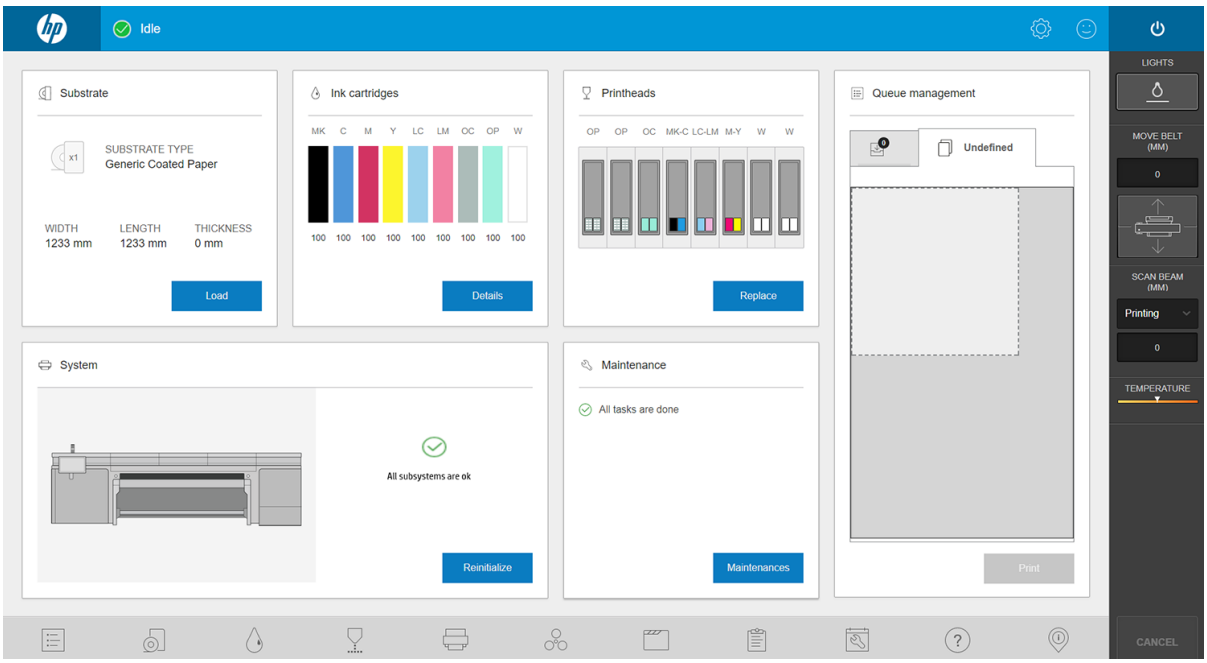
- The **substrate** widget helps you to identify the loaded substrate and to change its properties. You can also use it to load or unload the substrate. You can check the type, the size, and the thickness of the loaded substrate.

- The **ink** widget shows the amount of ink in the cartridges. In the expanded view, you can see detailed information on each cartridge, including its expiry date and serial number.

- The **printhead** widget shows the status of each printhead, and gives a graphical illustration of any issue. You can also use it to start printhead alignment and replacement processes.

- The **job preview** widget shows the status of the printer and the job queue.

- The **system** widget shows the status of the printer subsystems, with alerts, system errors, and other information about the health of the system. From here you can reinitialize a subsystem without restarting the whole printer, which allows you to recover quickly from a substrate jam.
- The **maintenance** widget shows the complete list of printer maintenance tasks, sorted by the dates on which they are next due. There is a Today section for tasks that should be done immediately, and an Overdue section for tasks that should have been done already. You can see in the list the frequency of each task, the time needed to execute it, and security considerations; and you can launch a maintenance task.



Printer status and alerts

The Internal Print Server displays the general status of the printer. General notifications appear in the system widget; more specific alerts appear in the appropriate widget (see Internal Print Server widgets on page 22).

Tap the widget for more information about the alert.

Update the firmware and the Internal Print Server

TIP: When updating the firmware and the Internal Print Server, first update the firmware and then the Internal Print Server.

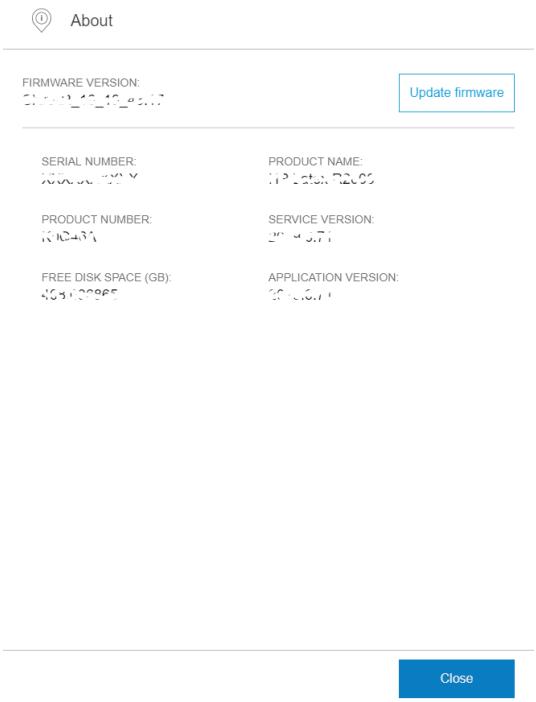
Update the firmware

From time to time firmware updates will be available from HP that increase the printer's functionality and enhance its features.

Firmware updates can be downloaded from the Internet and installed in your printer using the Internal Print Server:

1. Tap at the bottom of the Internal Print Server's main window.

2. Tap **Update firmware**.



3. A browser window opens. Look for the firmware update file, and install it.

IMPORTANT: Do not turn the printer off. When the firmware update process is finished, the printer will restart automatically.

The firmware includes a set of the most commonly used substrate presets. Extra substrate presets can be downloaded separately; see Substrate presets on page 74.

Update the Internal Print Server

1. Download the file to the built-in computer's hard disk (but not to the desktop).
2. Remove the current version of the Internal Print Server through the Control Panel. Select **Uninstall Internal Print Server Application**.
3. Unzip/extract the files **HPIPS.msi** and **Setup.exe**.
4. Run the file **Setup.exe** and follow the onscreen instructions until the new software is installed.

Internal Print Server settings and preferences

Change the language of the Internal Print Server

When the Internal Print Server starts, it uses the language selected in the Windows Regional and Language Options. To change the selected language:

1. Tap to the right of the window's title bar.
2. Tap **Current languages**.
3. Tap your preferred language.
4. Tap **Save**.

Change the units of measurement in the Internal Print Server

To change the units of measurement in the Internal Print Server, tap , then **Units**.

3 Install and configure the RIP software

A Raster Image Processor software (RIP) is required to process the images before they can be printed.

This software must be run on a separate computer. The computer requirements are specified by the RIP vendor. You will also need to deactivate the firewall.

This chapter describes how to install and configure the RIP correctly for use with the printer.

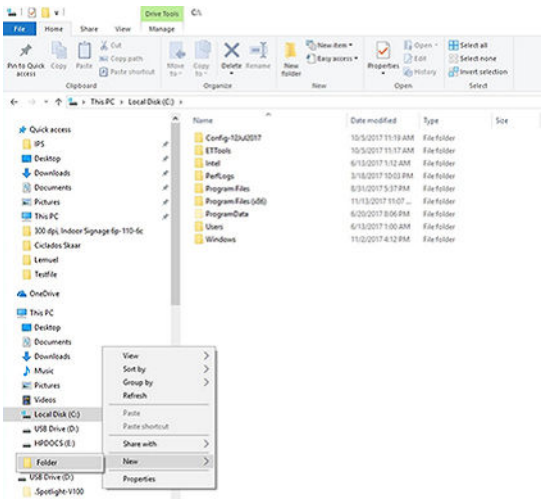
Two RIP software products from two different vendors are compatible with the printer:

- Caldera Grand RIP 11.2 software
- ONYX 12.2 RIP software

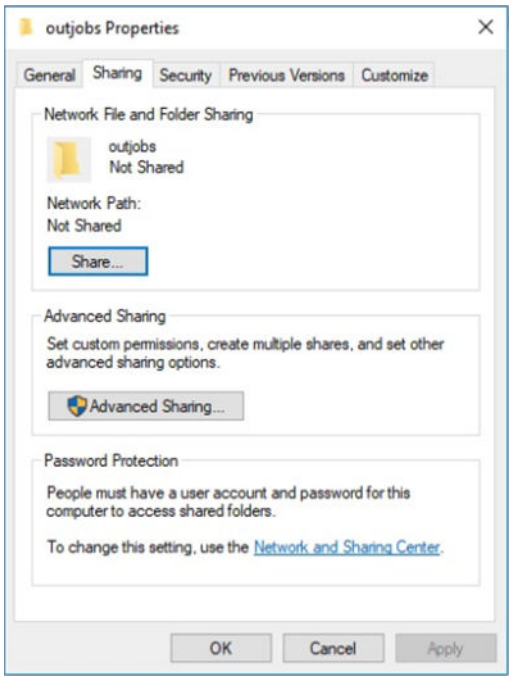
You need only one of these.

Create a shared folder

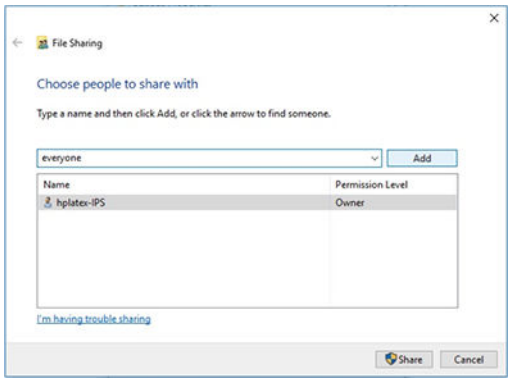
1. Create a folder to share on the local disk (D:).

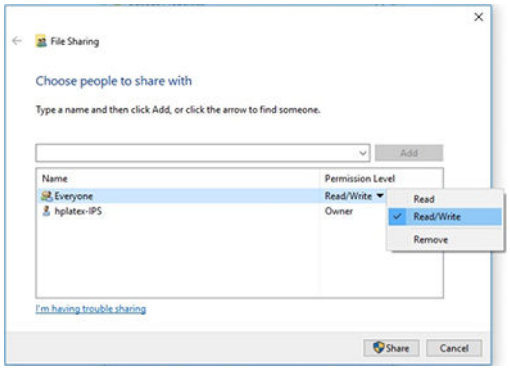


2. Open the folder properties for the new folder and navigate to the **Sharing** tab. Click **Share**.

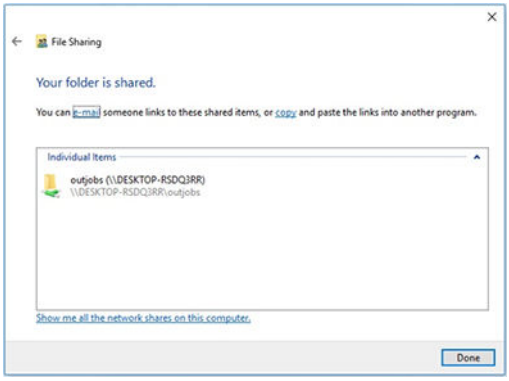


3. Add `Everyone` as a name and ensure that it has read/write permissions.

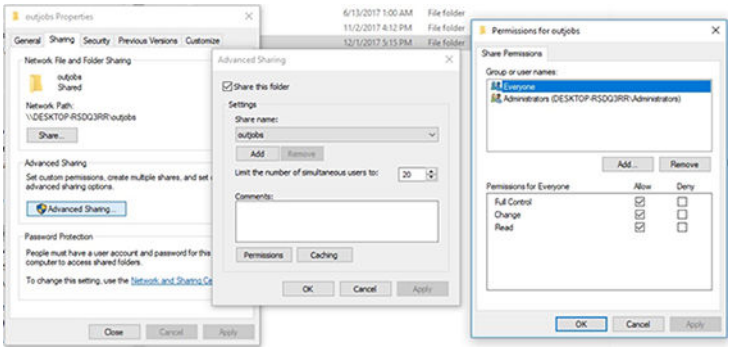




4. Click **Share**. The following screen appears.



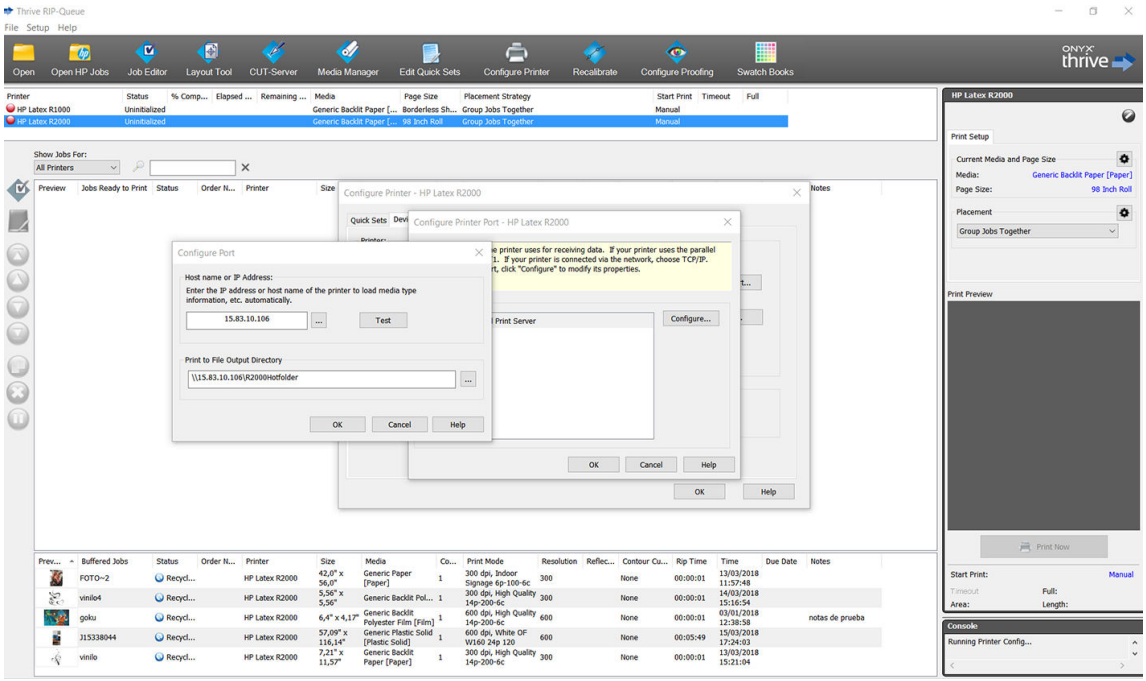
5. Click **Advanced Sharing** to double check the sharing properties.



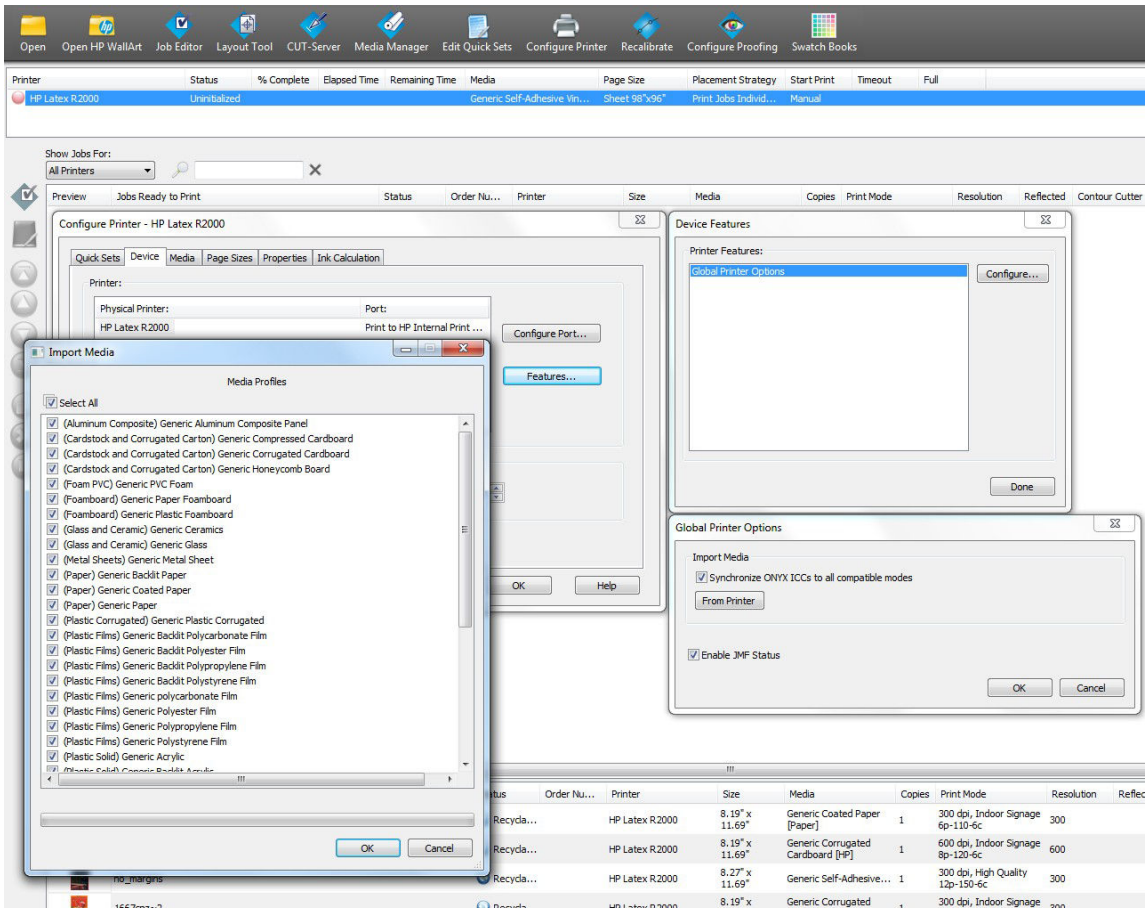
Install ONYX software and set up the driver

1. Download the ONYX installation packages and copy them to your computer's desktop.
2. If you already have the ONYX RIP installed, HP recommends uninstalling your current version.
3. Install the ONYX RIP software that you have just downloaded.
4. Download the latest driver and place it on your desktop.
5. Install the driver by double-clicking the installer icon.
6. Once installed, open the RIP and click **Configure Printer** > **Device** tab > **Configure Port** > **Configure**.
7. Set up the following values:
   - **IP address**: Enter the network address of your printer.
   - **Print to file Output Directory**: Click the **...** button and select your mounted hot folder (in this example, \\<IPS_IP_address>\Users\Public\SKAAR_HOTFOLDER).
8. Click **OK** to finish.

9. You can check connectivity by clicking the **Test** button.



10. Go to **Configure Printer** > **Device** tab > **Features** > **Configure** > **From Printer**. Select all substrates and click **OK** to synchronize them.



Whenever you install new Internal Print Server firmware, you are recommended to use the **Media Manager** button to delete all substrates and then synchronize again.

Install Caldera software and set up the driver

Follow the Caldera RIP and the printer driver installation instructions. After the RIP software has been installed and the printer has been added to the RIP, use the following procedures to configure the driver.

Mount the Internal Print Server hot folder

Before setting up the driver, you need to mount the Internal Print Server hot folder on the Caldera server.

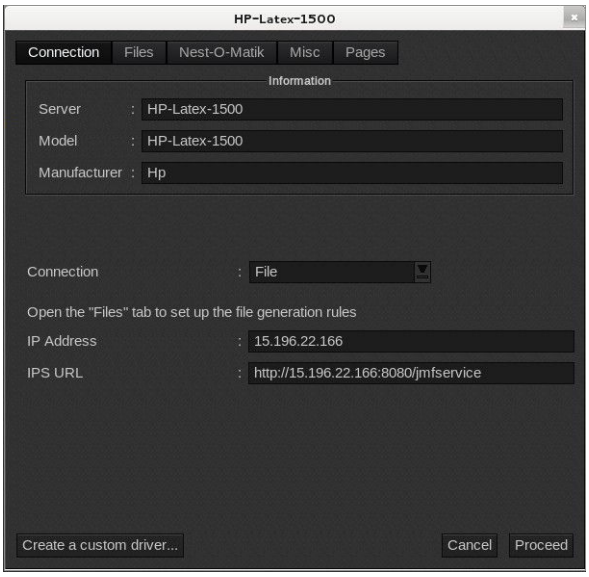
1. Open a terminal session.
2. Install cifs by entering the command:
   - `sudo apt-get install cifs-utils`
3. From Debian, create your local hot folder on /mnt/: (it will be linked to the Internal Print Server hot folder):
   - `cd /mnt`
   - `mkdir /hotfolder`
4. Mount the Internal Print Server hot folder: (**very important**)
   - `sudo mount -t cifs //IPSipadress/IPShotfolder /mnt/hotfolder -o user=youruseronIPS,domain=yourdomainonIPS,vers=2.0`

   (Domains such as: WORKGROUP, BCN, or AUTH)
5. When prompted, give the Caldera password: `caldera`
6. When prompted, give the password for the computer where the hot folder is located.

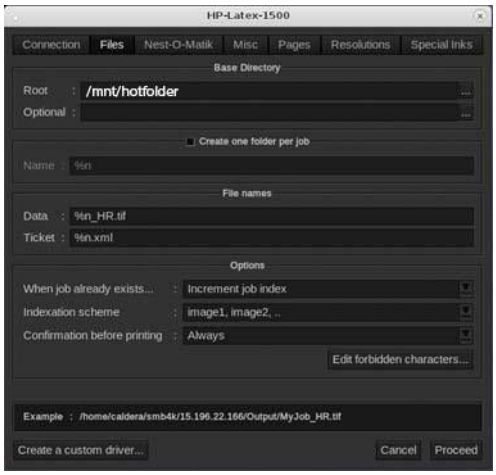
Whenever you restart the computer, you will need to repeat the mount command.

Configure the server administration

1. Open the Caldera RIP software, and enter the URL of your printer into Server Administration: for example, http:/15.196.22.166:8080/jmfservice.

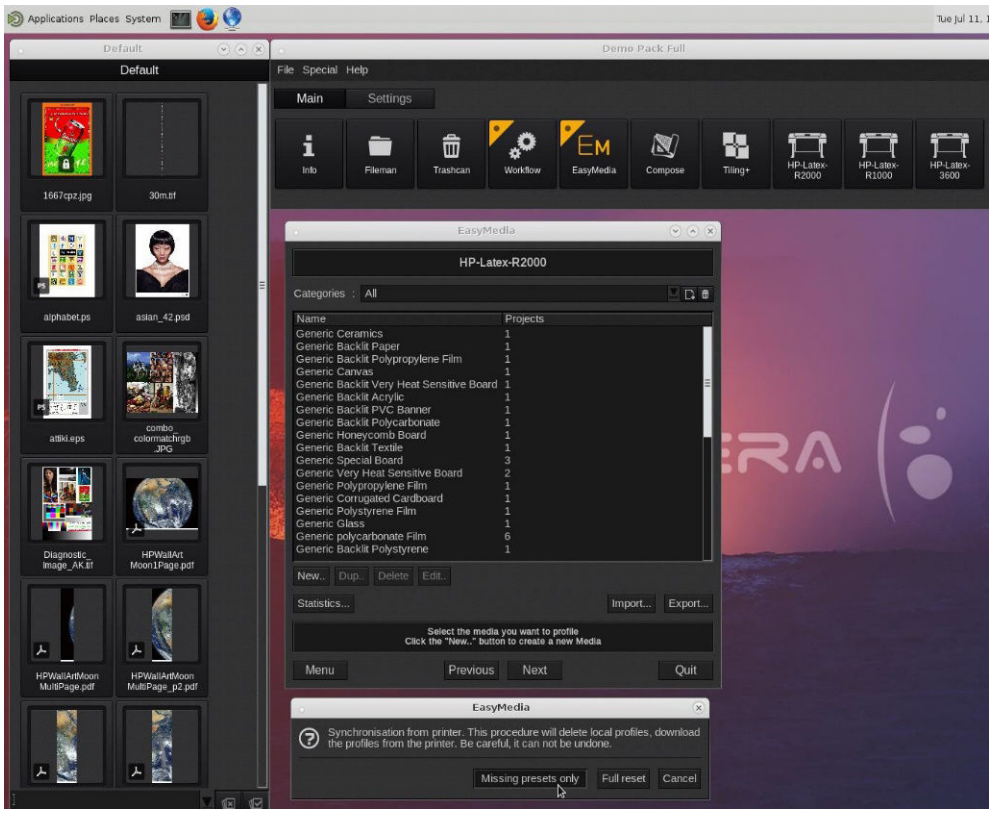


2. Set the path to your hot folder. Click the **...** button and select your mounted hot folder.



Synchronize substrates

▲ From **EasyMedia**, select the printer, and follow the steps to synchronize the substrates: **Import** > **Autosync** > **Missing presets**.



4 Printing workflows integration

- Introduction to JDF and JMF
  - What is JDF?
  - Benefits of working with JDF for file submission
- Working with JDF
  - Creating JDF job tickets
  - What information is captured by the printer and what can be communicated by JMF to an MIS?
  - Guidelines for integration
    - How to integrate the printer series into the Caldera RIP
    - How to integrate the printer into the Onyx RIP
    - Job submission methods
    - How to integrate the printer into an MIS system or production control software

Introduction to JDF and JMF

What is JDF?

JDF is a software method by which devices from a variety of vendors and manufacturers can interoperate together. It uses a text-based language known as XML that is compliant with many devices and workflow controllers in varying vertical print markets.

JDF implementation is typically based upon an MIS system to be use for job scheduling, submission, accounting, and costing. An integrator typically interfaces an MIS system to the devices that are present in a workflow through JDF technology.

JMF is a communication protocol (based upon the JDF specification) that allows devices to communicate job status information and other real-time job metrics and parameters. It can be used to poll a device for status or to watch a device at regular intervals.

Benefits of working with JDF for file submission

JDF can be useful in providing an accurate MIS-driven way to find the job status of content as well as when a device has completed a job. Since the role of an MIS is to track, schedule and cost-account for a job, JDF/JMF allows for a simple way to interface devices to an MIS for this task.

JDF and JMF can be used to be able to analyze and later perform accounting principles upon work created in a JDF workflow. A detailed analysis can be performed after a day or series of jobs to see the profit margin of a job, the costs and materials consumed, as well as inventory control and stock consignment.

HP is a partner member of the CIP4 organization, and you can obtain many more details about JDF at the CIP4 www site at http://www.cip4.org.

Working with JDF

Creating JDF job tickets

JDF Implementations typically use an MIS system to control and monitor a JDF/JMF workflow. The MIS can then monitor a device's status, can track time and consumables and provide interfacing with counting and inventory control modules integrated into an MIS. An MIS is typically the origin of a JDF job and resultant ticket. JMF communication can be used to send that ticket information to production milestones. An MIS is typically the origin of a JDF job and resultant ticket. JMF communication can be used to send that ticket information to production milestones.

What information is captured by the printer and what can be communicated by JMF to an MIS?

The printer implements a subset of the JDF 1.5 specification, using JMF. This allows it to communicate printer-status, and notifications together with job status, job ink, and substrate consumption to external applications.

NOTE: It is important to consider the fact that the RIP is capable of combining several jobs into one for the purpose of substrate optimization, and finishing. In this example, the printer sees the print as one job. In this situation, the MIS should query the RIP for the status of each individual job on the nest.

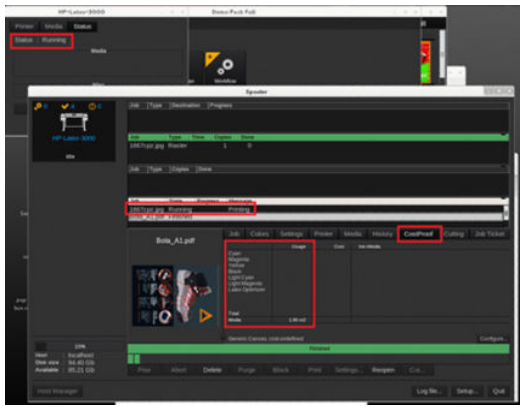
The RIP application can retrieve substrate and consumable tracking to report back to MIS.

Guidelines for integration

How to integrate the printer series into the Caldera RIP

The Caldera 11.2 RIP can take advantage of the JDF interface in the printer by selecting the option on the printer driver setup. Once the JDF interface is enabled, the RIP will display printer status and notifications together with job status and ink and substrate consumption.

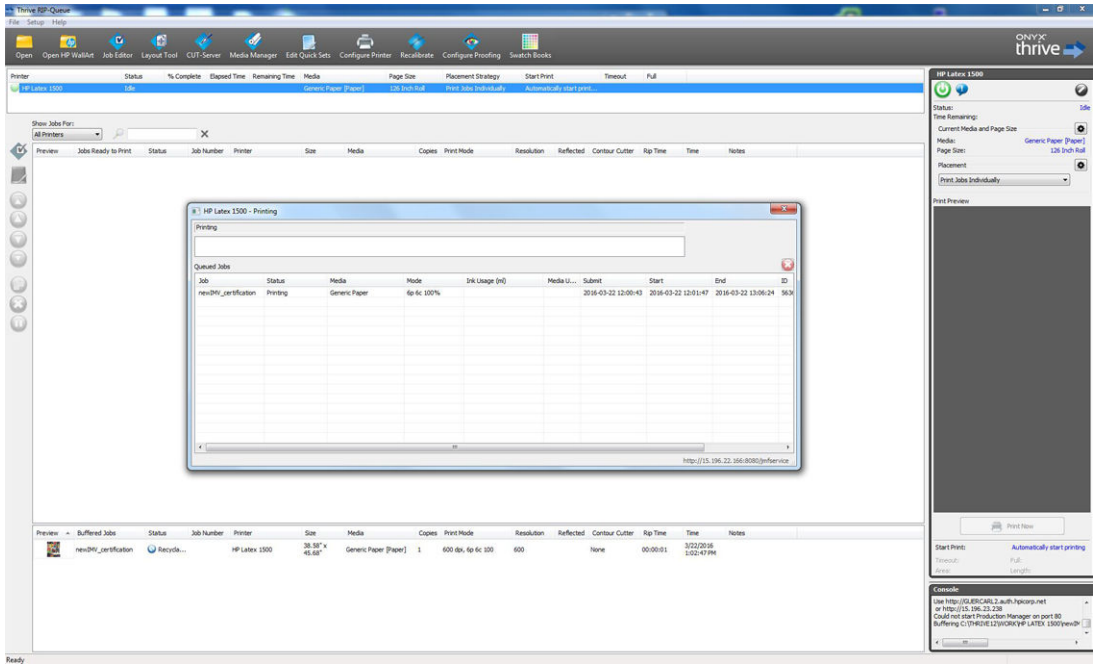
You can display the printer status by opening the info window in the print client, and opening the spooler for the job status.



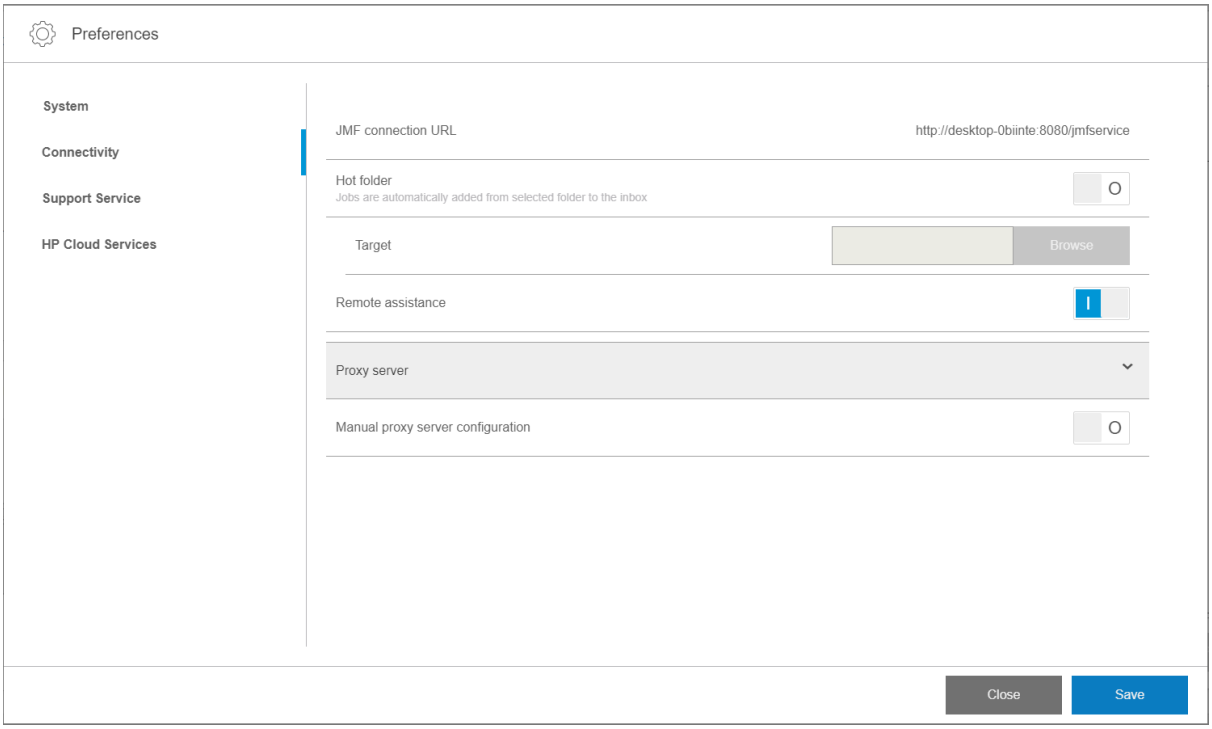
How to integrate the printer into the Onyx RIP

Onyx 12.2 can take advantage of the JDF interface in the printer by selecting the option on the printer driver setup. Once the JDF interface is enabled, the RIP will display printer status and notifications together with job status and ink and substrate consumption.

You can display the printer and job status opening the Info window in the RIP queue.



To obtain the JMF URL: Go to the Internal Print Server, and tap , then **Connectivity**.

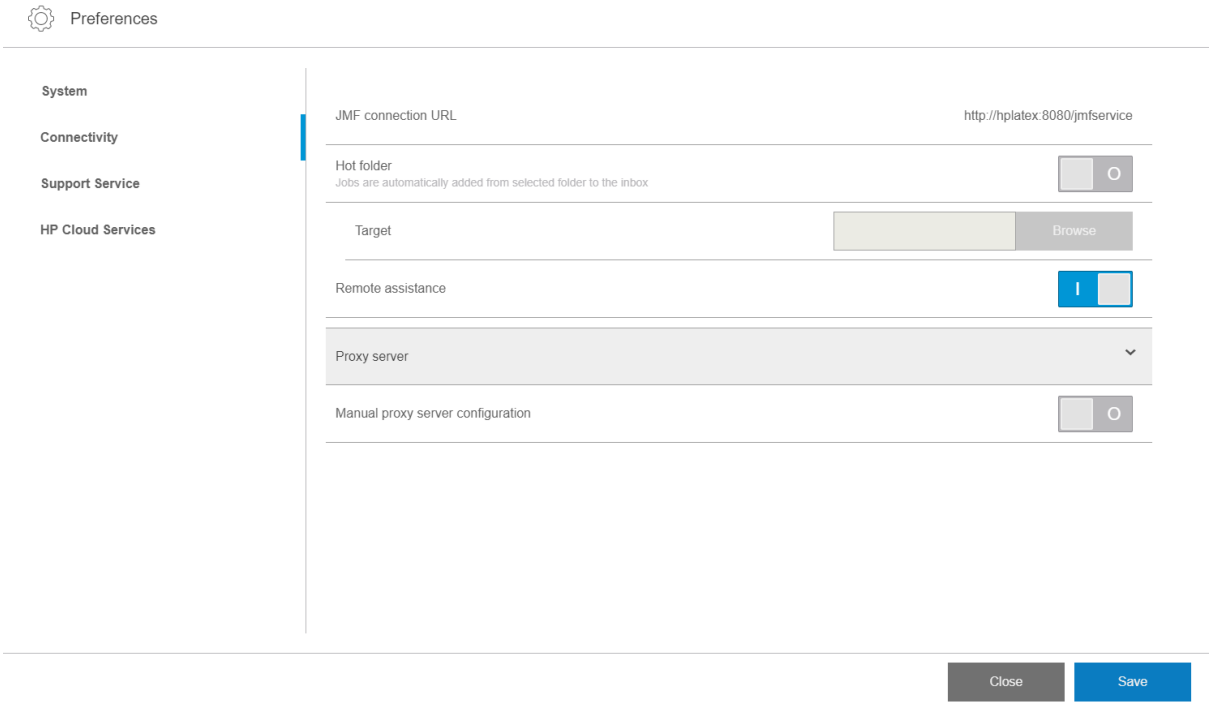


If there are problems using the printer's hostname, switch to the printer's IP using the HP Latex System Configuration Tool. For more details, see the service manual or talk to your network administrator to solve hostname resolution.

Job submission methods

The printer supports two file submission methods (in addition to opening a file directly in the Internal Print Server):

To choose the submission method, in the Internal Print Server tap , then **Connectivity**, then choose whether or not to use a hot folder. If you want to use a hot folder, select the hot folder that you want to use.



- **JMF connection URL:** The RIP sends the location of the job in a JMF command; the IPS automatically looks for the files there, and loads them directly into the printer queue.
- **Hot folder:** Select a shared folder in the built-in computer, and the RIP copies the output job there; then the Internal Print Server automatically loads the job into the queue.

NOTE: The shared folder should be the same as the one configured in the RIP.

You can remove a queued job from the queue directly from the RIP interface, but only if it was submitted using the JMF method.

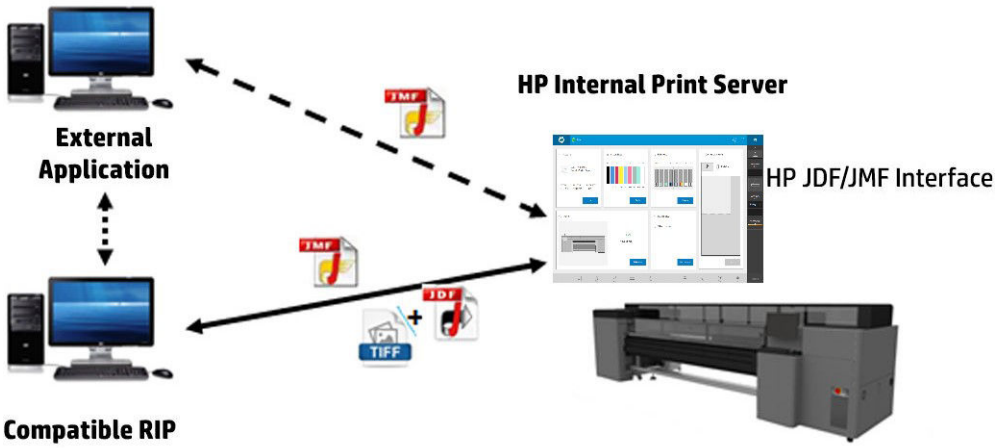
How to integrate the printer into an MIS system or production control software

Specific RIP/MIS implementations will require vendor specific configurations.

MIS or Production Control Software applications can retrieve printer status and notifications together with job status, job ink and substrate consumption, from the printer via the HP JDF/JMF Interface. It is also possible to remove a job in the printer queue via the HP JDF/JMF Interface.

As explained in the previous section, if the RIP combines several jobs into one before sending it to the printer, the recommendation is to connect the MIS or Production Control software to the RIP instead of the Internal Print Server, in order to get the individual job status of each grouped job.

Be sure to assign unique names to each job in order to identify them on the gathered information from the printer.



If you are using the Caldera 11.1 RIP, the MIS can communicate using the Caldera Nexio module. Caldera Nexio is a tool that connects the Caldera RIP and other third-party software using standard JDF/JMF protocols, making it possible to produce automatic sequences of actions that speed up production and advanced reports to improve operations. Contact Caldera for further information.

Onyx customers wishing to integrate with MIS solutions can use the Onyx Connect module to communicate via JDF. Onyx Connect does not currently support JMF. Contact Onyx for further information.

If you are using another RIP solution, contact your specific RIP vendor for JDF/JMF configuration and interface guidelines.

MIS vendors or customers that would like to integrate the printer with a solution directly can obtain the HP-supported JDF software development kit from the HP Solutions Portal: http://www.hp.com/go/solutions.

5 Handle the substrate

- Introduction
- Rigid substrate types
- Flexible substrate types
- Substrate tips
- Printer configurations
- Substrate configuration
- Load substrate into the printer
- View information about the loaded substrate
- Substrate edge holders
- How to print
- Unload a roll
- Take-up reel

Introduction

The printer can print on both rigid and flexible substrates. When printing on flexible substrates, HP recommends installing the roll printing kit for best results.

The printer can work better with some substrates than others. Factors such as substrate flatness, texture or smoothness, reaction to heat, surface tension, and chemical composition can affect the print quality, the adherence of the ink to the substrate, and the overall usability for a particular application. Always test that a new substrate meets your requirements before purchasing a large quantity.

There are many different types of print substrates available throughout the world, although brands, selection, and quality will vary by region.

Rigid substrate types

The following rigid substrate types are compatible with your printer. For tips on how to use each substrate, see Rigid substrate recommendations on page 298.

Foam boards

- Paper foamboard
- Plastic foamboard

PVC foam

- PVC foam

Corrugated plastic

- Fluted polypropylene

Solid plastic

- Acrylic
- Polycarbonate
- Polypropylene
- Polystyrene
- Solid PVC

Cardstock and corrugated carton

- Cardstock
- Corrugated cardboard
- Honeycomb board

Aluminum composite

- Aluminum composite panel

Wood

- Wood

Glass and ceramic

- Glass
- Ceramics

Metal sheets

- Metal sheet

Specials

- Special board

Flexible substrate types

The following flexible substrate types are compatible with your printer. For detailed characteristics and applications of each substrate, see Supported HP flexible substrates on page 329.

Self-adhesive vinyl

- Self-adhesive vinyl

Banner

- Banner

Paper

- Coated paper
- Uncoated paper

Plastic films

- Polycarbonate film
- Polyester film
- Polypropylene film
- Polystyrene film

Textile

- Textile
- Canvas

Substrate tips

Maintain the substrates

Keep substrates in their sealed wrapping material while they are in storage, and store rolls vertically to avoid the migration of plasticizers in some materials.

Move substrates from the storage area to the print production area at least 24 hours before use, so that they can adapt to its temperature and humidity.

General tips

Handle unprinted and printed substrates with care, and preferably with cotton gloves, to avoid fingerprints. For rigid sheets or heavy rolls, use a forklift, and two people wearing security shoes.

Before loading any substrate:

- Check that temperature and humidity in the room are within the recommended ranges for the printer. See Environmental specifications on page 295.
- Wear gloves when handling substrate, to avoid leaving fingerprints and oils on it.

  If you find fingerprints, dust, or anything else on the substrate, you can wipe the substrate with a cloth dampened with a general-purpose industrial cleaner (such as Simple Green).

  To clean the substrate after it has been printed, you can wipe the printed substrate with a cloth dampened with water or a domestic (not industrial) glass cleaner.

  ⚠ CAUTION: In both cases, avoid dropping liquid directly onto the substrate: apply it to the cloth and then wipe.
- Check that neither the substrate nor the core of a roll are bent or deformed, which may cause the substrate to jam in the printer.
- If the substrate has been stored in a place not offering the recommended environmental conditions, allow some time for it to adapt to the temperature and humidity of the printer's environment.
- Check which is the correct side for printing. In the case of a roll, read the label inside the core or the note inserted into the package.
- In the case of a roll, check that the substrate is correctly attached to the input core. Otherwise, the Internal Print Server will report an error.
- Before loading a flexible substrate, check its thickness and respond as follows:
  - Up to 0.4 mm (0.016 in): Print normally.
  - 0.4 to 1 mm (0.016 to 0.039 in): Raise the carriage beam to a custom position.

    The standard edge holders are designed to work with flexible substrates up to 0.5 mm (0.020 in) thick.
  - More than 1 mm (0.039 in): Load as a sheet of rigid substrate.

  The printer automatically checks the thickness of rigid substrates after loading.

After you have loaded any substrate:

- If you intend to use substrate edge holders, do not use edge holders from another printer.
- Check the correct carriage beam position for printing: customized position for thick substrates, printing position for others. See Set the carriage beam position on page 83.
- Check that you are using the correct substrate preset in the Internal Print Server and the correct ICC profile and other settings in the RIP.
- HP substrates are optimized to provide the best out-of-the-box printing experience with your printer.
- Use the Internal Print Server to check that any calibrations appropriate for your substrate have been done: printhead alignment, color calibration. See Printer calibration on page 114.

You can find further information on the Web:

- The specifications, finishing, processing, and warranty information for each individual HP substrate are available from http://www.globalBMG.com/hp/signagemedia and http://www.globalBMG.com/hp/HPMediaWarranties.
- HP Image Permanence information is available from http://www.globalBMG.com/hp/printpermanence.
- HP offers to recycle some substrates through the HP Take-Back Program, such as HP HDPE Reinforced Banner, HP Light Textile Display Banner, HP Heavy Textile Banner, HP Everyday Matte Polypropylene, 3-in Core, and HP DuPont Tyvek Banner. Recycling opportunities for these products may not exist in all areas. You should consult local recycling resources about recycling these products. For recycling in the USA, see the HP recycling services site, http://www.hp.com/go/recycleLFmedia/.

  HP offers to recycle some other substrates through the standard paper recycling process, such as HP White Satin Poster Paper, HP Photo-realistic Poster Paper, HP Coated Paper (3-in core), HP Universal Coated Paper (3-in core), HP Universal Heavyweight Coated Paper (3-in core), HP Heavyweight Coated Paper (3-in core), and HP Super Heavyweight Plus Matte Paper (3-in core).

Color consistency

Your printer has been designed to provide an excellent experience in terms of color consistency and repeatability. This allows large jobs such as fleet graphics and wall coverings to be printed in tiles or panels, with confidence that, when the finished panels are placed edge to edge, the colors will match at the joins.

The color variation within a printed job has been measured to be within this limit:

Maximum color difference (95% of colors) ≤ 2 dE 2000

NOTE: This is based on reflective measurements on a 943 color target under CIE standard illuminant D50, and according to the standard CIEDE 2000 as per CIE Draft Standard DS 014-6/E:2012. 5% of colors may experience variations above 2 dE 2000. Backlit substrates measured in transmission mode may yield different results.

Color matching is dependent on many external factors. Take the following points into account to achieve this level of consistency:

- If a large job is being printed in panels, more than one roll may be required. All rolls should be from the same batch, and stored under correct conditions according to the manufacturer's specifications.
- Operating conditions (temperature and humidity) should be kept constant during the printing of the entire job.
- Ensure that a printhead check and clean routine has been run prior to starting the job. If any printhead changes are required during the job, printhead alignment and color calibration should be done.

See also Color calibration on page 124.

Rigid substrate handling guidelines

- Never use a sheet of substrate that exceeds 68 kg (150 lb) in weight.
- To reduce the risk of damage due to a head strike, do not print on a sheet longer than the tables are designed to support. Optional extension tables are available to support longer sheets.
- Tables should be leveled so that the tops of the table rollers are level and coplanar to the flat surface of the substrate belt.
- Ensure that the tables are latched securely to the printer, to establish a proper grounding path for any residual static that may build up on the substrate.
- Generic substrate settings may need to be adjusted when using substrates that deform when subjected to sustained heat. These cases may require some combination of a higher vacuum setting, lower

temperatures, higher-than-standard head height, and configuring the printer for heat-sensitive substrates to achieve the best results.

Rigid substrate properties

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room.
- For best results, individual sheets should be flat. Curves in either axis (left to right, or front to back) can lead to head strikes of the printheads on the substrate. Accuracy of dot placement or overall feed accuracy can also be affected by non-flat substrate.
- For best results, sheets should have parallel opposite edges with 90° corners. Sheets that are not rectangular will require extra attention when loading.
- Both sides of the substrate should be clean and dry.
- Some substrates may have a surface coating. Certain coatings may cause ink to pool and cure unevenly, yielding poor print quality. Be sure to test coated substrates for compatibility before purchasing significant quantities.
- Be careful to avoid substrates with bent or damaged edges, especially metal composite and corrugated substrates. In addition to the risk of damage due to a head crash, they may create drag or vacuum loss that results in substrate feed errors or skew.
- Some substrates may show thickness differences within the same sheet. Those differences may create print-quality issues or may lead to head strikes. When loading substrates that may have thickness differences, such as acrylic cast sheets or natural woods, measure the sheet thickness at different points and introduce the highest measured value manually.

Static electricity

Static electricity is often a problem when working with rigid synthetic substrates. These substrates are often non-conductive, so static charges cannot dissipate on their own. Besides minor personal discomfort from static shocks, static attracts foreign particles to the substrate that prevent ink from adhering to the surface. Static can also attract ink droplets to areas of the surface that were supposed to remain unprinted. Low humidity levels in the printer and substrate storage environment can exacerbate the issue.

A number of active and passive methods can be employed to minimize static:

- Maintain a relative humidity level of 40–60% in both the printer and substrate storage areas.
- Drape a conductive material such as copper tinsel over the stacks of substrate and attach it to a grounding point. This will help to discharge the static from each sheet as it is removed from the stack.
- Wipe down the substrate surface prior to printing with a general-purpose industrial cleaner (such as Simple Green). This will remove any foreign particles that were attracted to the substrate by static.
- For extreme static problems, careful use of an antistatic spray may be warranted. Lightly spray on, not allowing it to pool on the substrate. Note that the ink-adhesion properties of some substrates may be negatively affected by the spray, so use the minimum amount necessary to achieve results. Adhesion decreases approximately 10%; this typically occurs on substrates that already had poor adhesion properties without the spray.

Printer configurations

By default, the printer prints on a sheet of rigid substrate; loading instructions are displayed by the Internal Print Server. For more information, see Load rigid substrate on page 46.

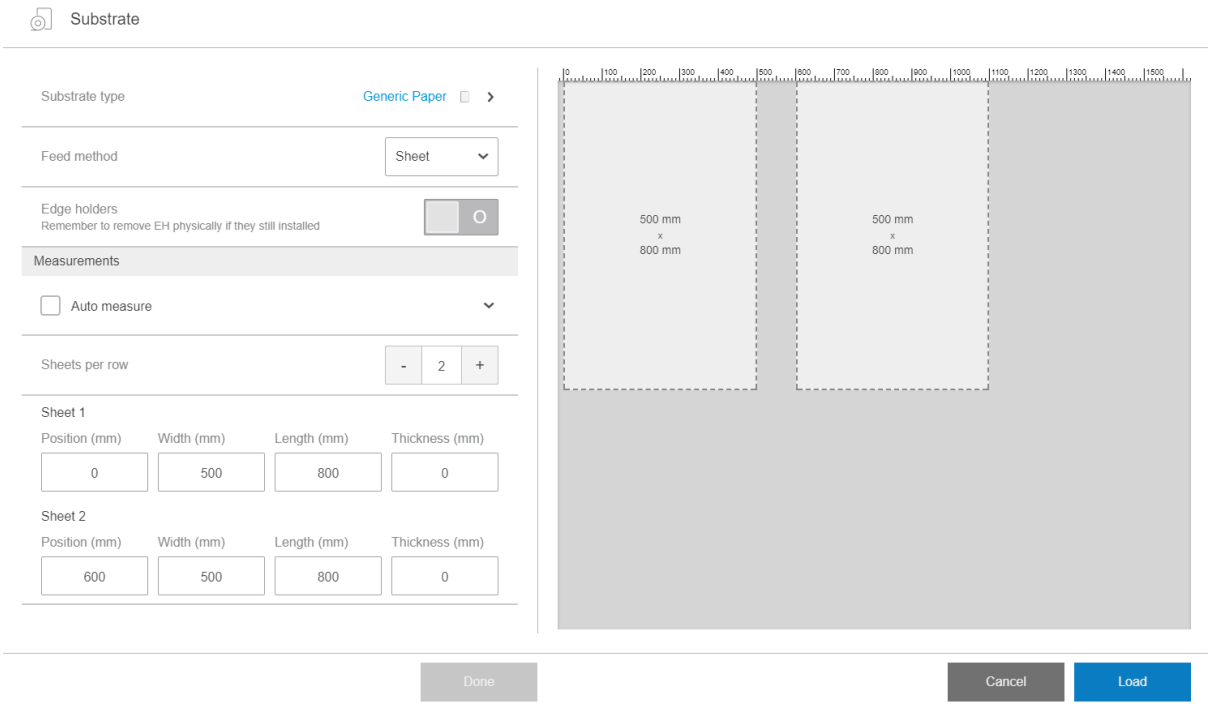
If you have the roll printing kit installed, the following alternative configurations are available:

- Print on a roll of flexible substrate on a spindle, with the output falling freely to the floor. See Place a roll onto the spindle on page 53 and Load a roll into the printer on page 55.
- Print on a roll of flexible substrate on a spindle, with the output collected on a take-up reel. See Place a roll onto the spindle on page 53 and Load a roll into the printer on page 55.
- Print on a roll of flexible substrate without spindle, resting on a table-top roll holder.

NOTE: The use of spindle or take-up reel requires optional accessories.

Substrate configuration

Various parameters can be changed in the **Substrate** window.



Substrate parameters

When loading substrate, the following parameters can be chosen:

- Substrate type
- Auto-measure

  These measurements are used only if automatic measurement is not activated.

  - Position
  - Width
  - Skew
  - Thickness

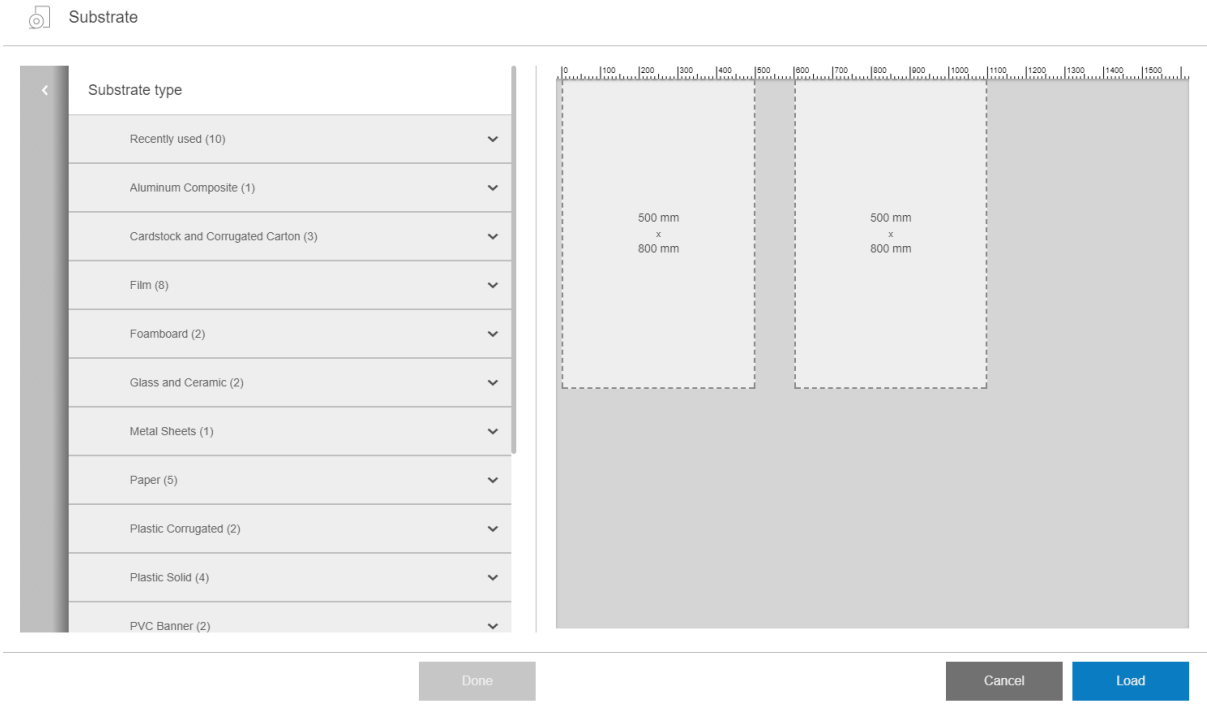
IMPORTANT: The length of a rigid substrate is never measured automatically: you must always enter it manually.

- Sheets per row, for multisheet printing only (see Load multiple sheets on page 48)

Substrate type dialog

In the **Substrate type** dialog box, you choose a substrate type.

You can choose from a list of rigid substrates. If you have the roll printing kit installed, you can also choose flexible substrates.



Tap a substrate name to select it.

Automatic measurements

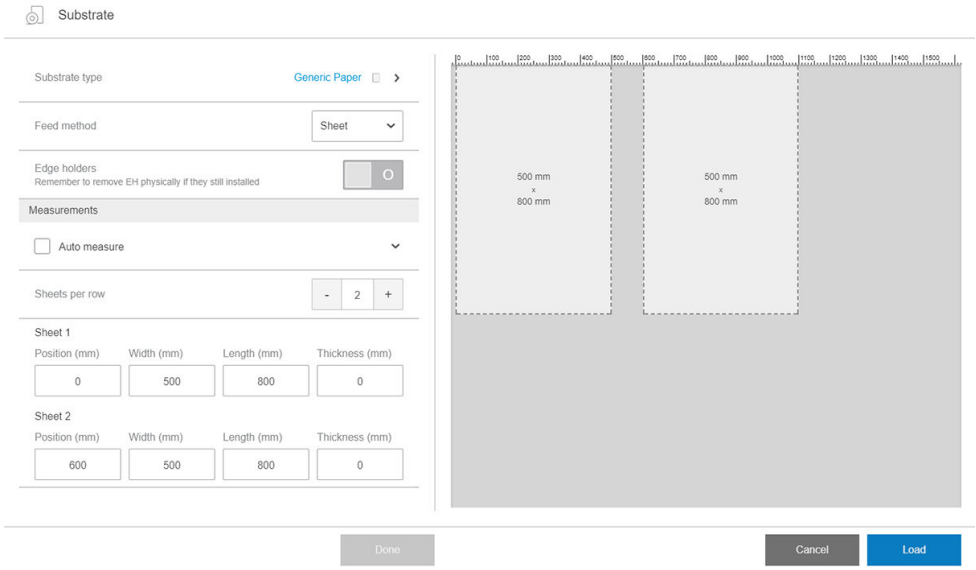
If automatic measurements are enabled, the printer automatically measures the substrate once it has been loaded. The following characteristics are measured:

- Width
- Thickness
- Skew

Substrate status

The substrate status is displayed in the print preview.

- **Loaded**: When the selected substrate configuration corresponds to the one that is physically loaded in the printer.

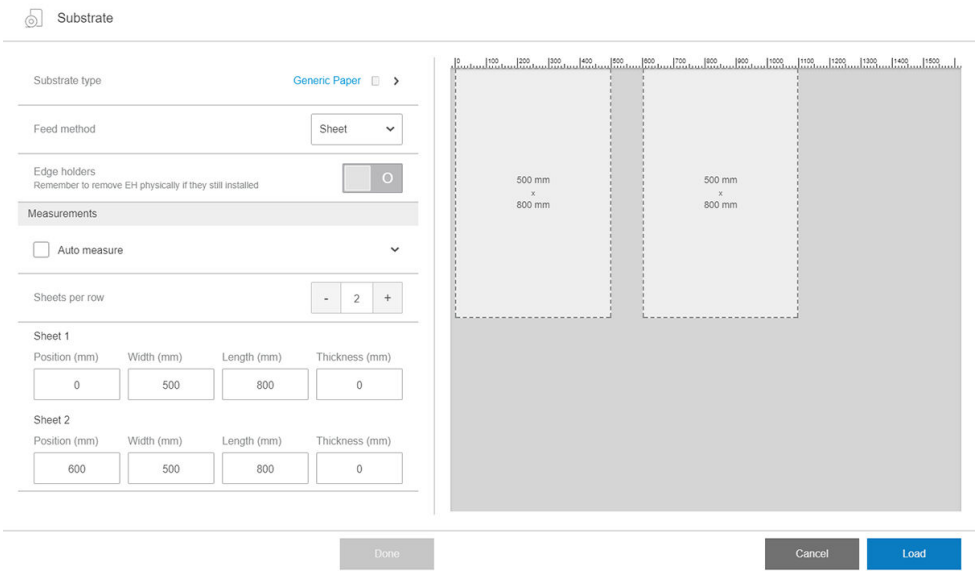


To print more than one sheet in a row, you can use N-up printing. See Multi-sheet N-up on page 52.

Substrate dimensions

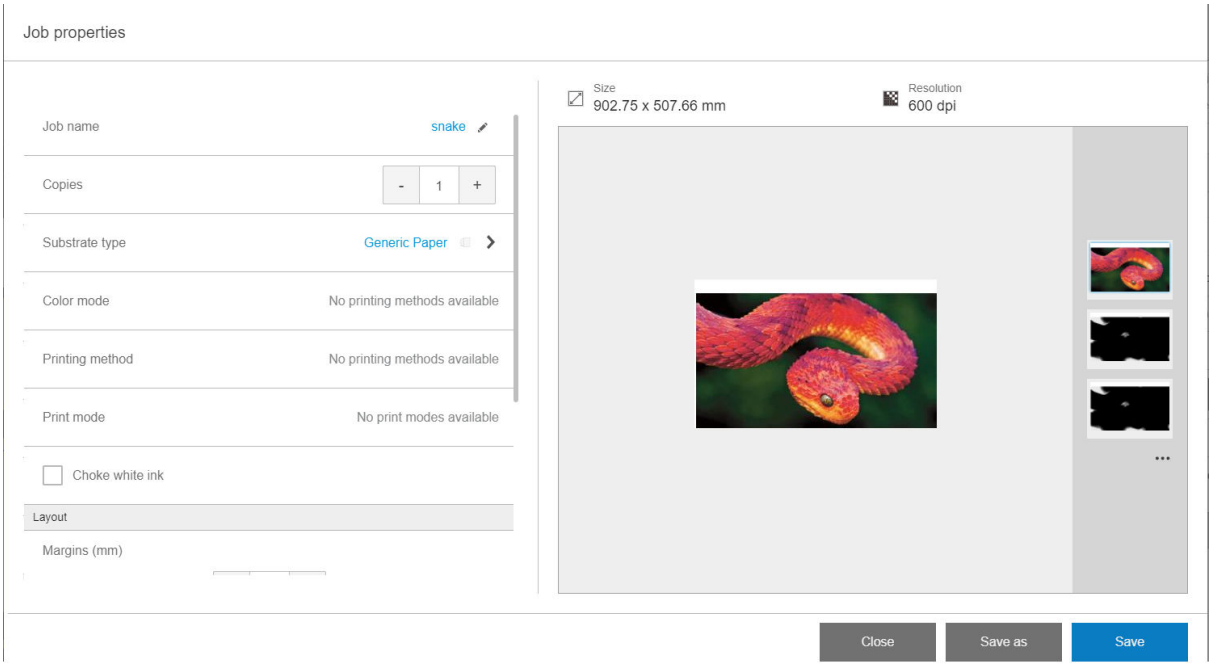
The substrate dimensions can be changed within the substrate dialog.

IMPORTANT: When loading a rigid substrate, you should always enter its length manually.



Job properties

From the Internal Print Server's main window, double-tap the print queue to open the Job Properties window.



Use the **Save As** button to create a copy of an existing job with a different name.

This dialog has the following basic options:

- **Copies**
- **White mode**: Visible only when **Color + white** is selected
- **Print mode**
- **Choke**
- **Margins**: Left, right, top, bottom
- **Alignment**: Left, center, right

Margins, alignment, and number of copies can also be selected to the right of the preview area.

Although the substrate and print mode can be changed from this dialog window by using the change button, HP recommends not to do so because it may adversely affect print quality. It is better to change the substrate and the print mode from the RIP.

NOTE: The Internal Print Server gives you a warning if you select layout changes that are not compatible with your selections in the RIP.

Load substrate into the printer

The loading procedure depends on whether you are loading a rigid or flexible substrate.

See also Substrate edge holders on page 57.

Load rigid substrate

http://www.hp.com/go/latexRseries/load_and_print_rigid

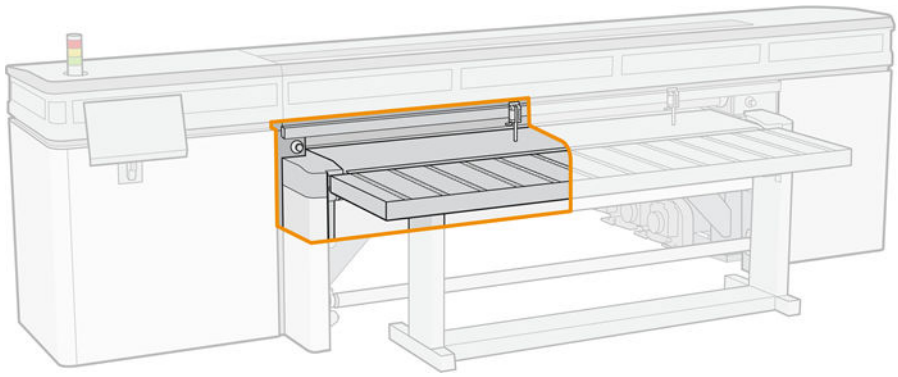
CAUTION: If you see that the substrate is deformed in some way, do not try to use it. Deformed substrates may get stuck in the printer and cause head crashes.

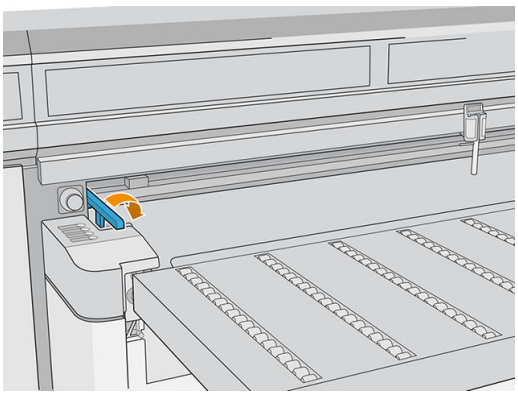
CAUTION: Under some conditions, substrates can be sensitive to heat. Before starting to print, see Use Sensitive Mode with heat-sensitive substrates on page 299.

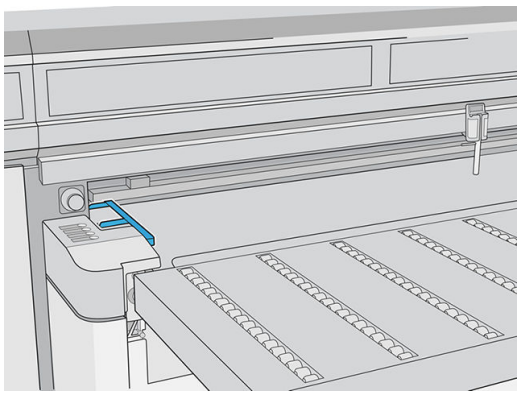
IMPORTANT: The maximum thickness loadable is 50.8 mm (2 in).

Load a single sheet

1. Pull down the left alignment bar.

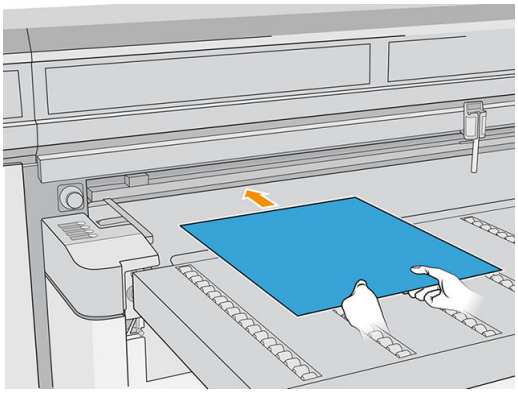


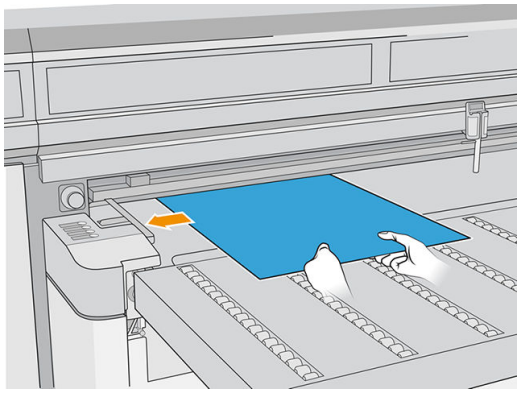


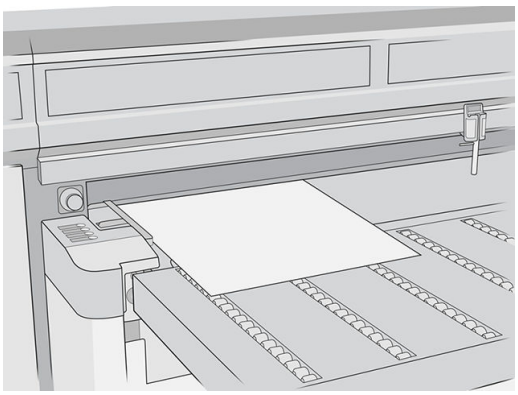


2. Place the substrate on the substrate-advance belt, and align it against the front alignment bar, then against the left alignment bar.

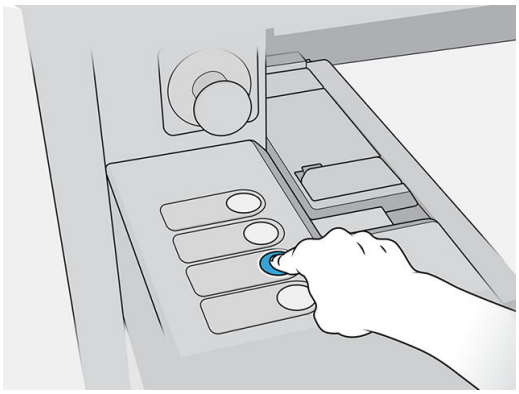
NOTE: For best results, the alignment should be done in this order.







3. Remove the left alignment bar.
4. Tap **Substrate ready** on the touchscreen or press the equivalent quick-access button on the printer.



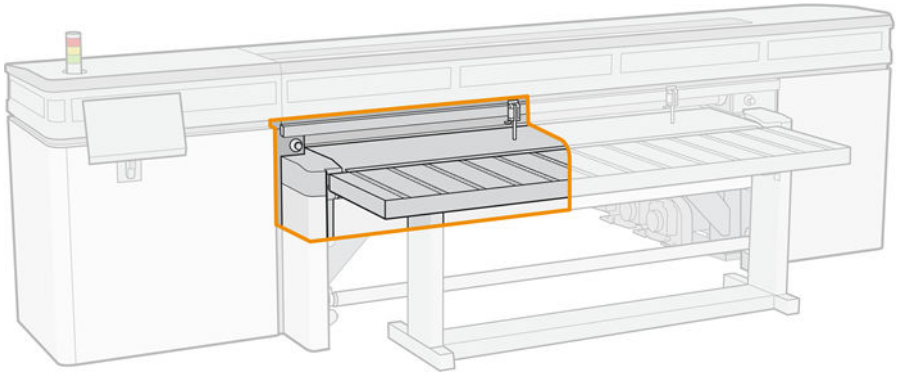
Load multiple sheets

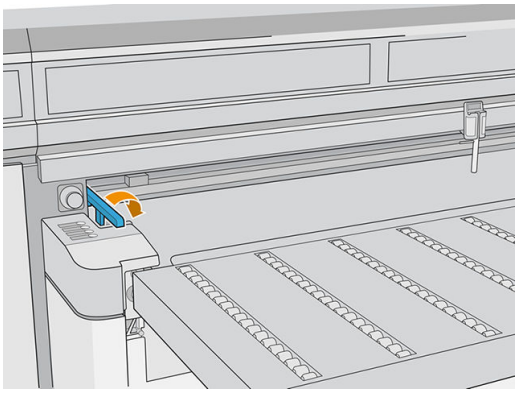
Multiple-sheet N-up allows you to print more than one copy of a single job or multiple jobs on multiple sheets across the belt of either the same or different dimensions, using multiple rows of sheets until the job is complete. Use the built-in substrate alignment pins for quick positioning of the sheets across the printer's width. Align the left side of each sheet with one of the pins, with a small space from the right edge of the sheet to the next pin, to allow for variations in sheet dimensions. Alternatively, if you position the pins with zero clearance between the sheets and each pin, before each print be sure to raise the pins over the thickness of the sheets; otherwise the sheets could become skewed.

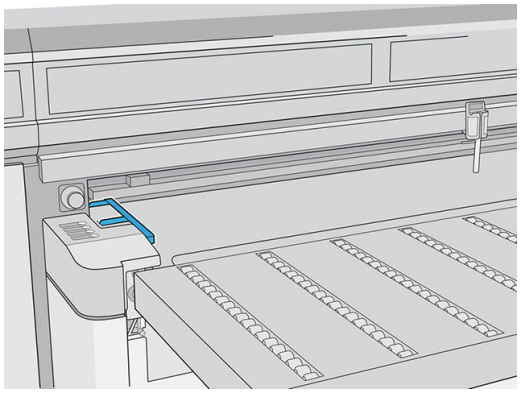
NOTE: This type of printing works best with an image that has wide margins on all four edges, but edge-to-edge printing is also possible by carefully matching the dimensions of the image(s) to the dimensions of the substrate sheets. Margins can be defined by the RIP or can be set and adjusted on the printer.

When loading substrate, place the number of sheets you intend to print in position to be loaded across the width of the printer. Sheets must not be more than 7.6 cm (3 in) apart from each other. Use the alignment pins if you will be printing multiple rows.

1. Pull down the left alignment bar.

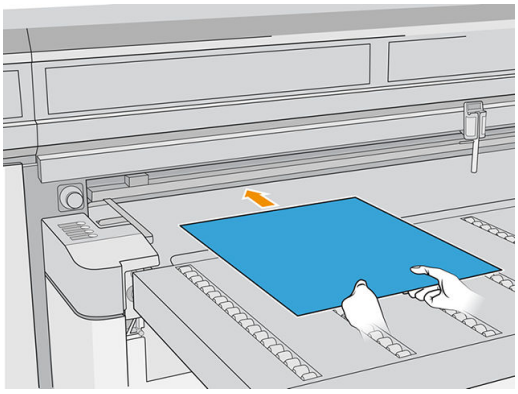


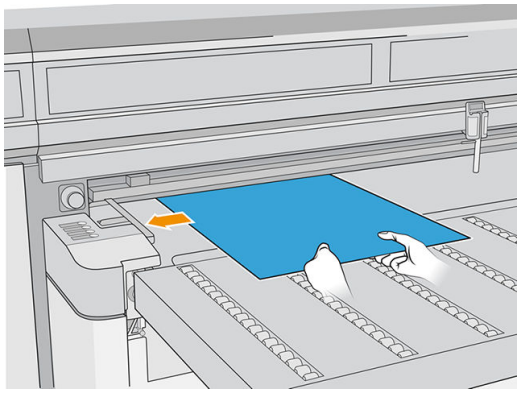


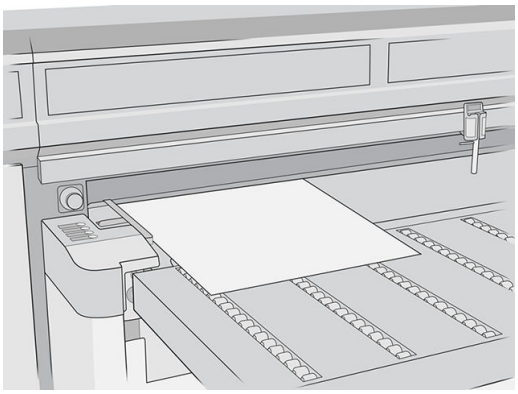


2. Place the substrate on the substrate-advance belt, and align it against the front alignment bar, then against the left alignment bar.

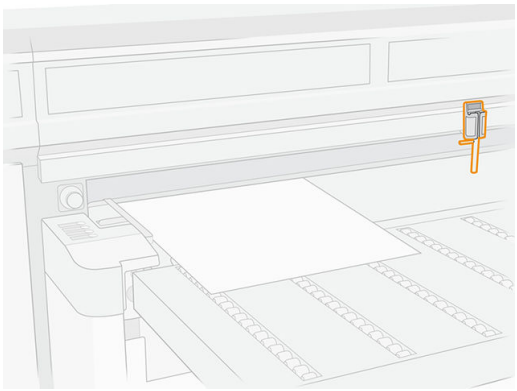
NOTE: For best results, the alignment should be done in this order.

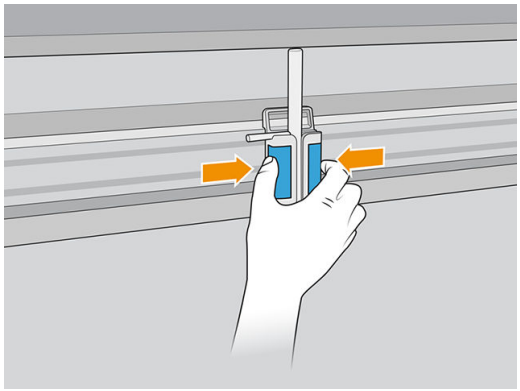


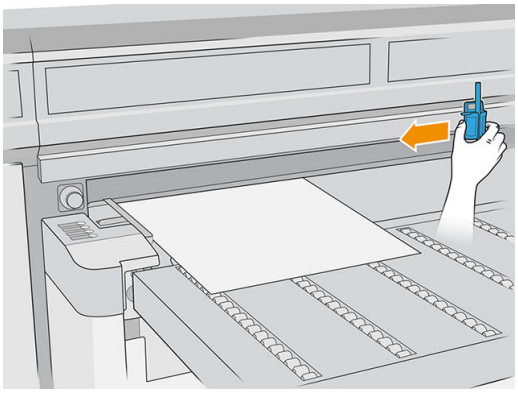




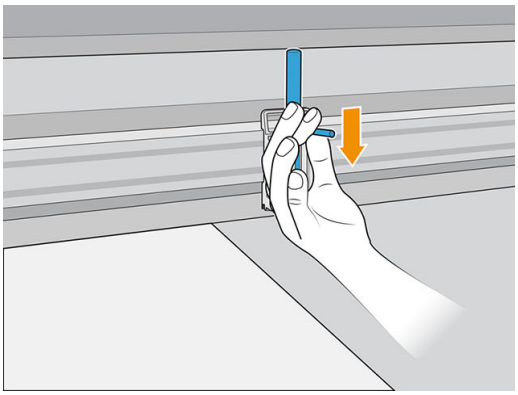
3. Locate the closest pin, squeeze the grip, and slide the pin to the position at which the left edge of the next sheet will be placed.

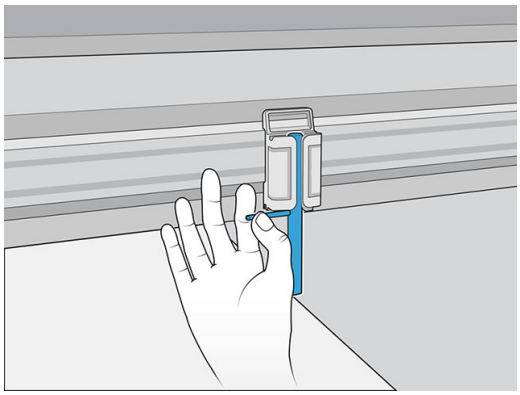




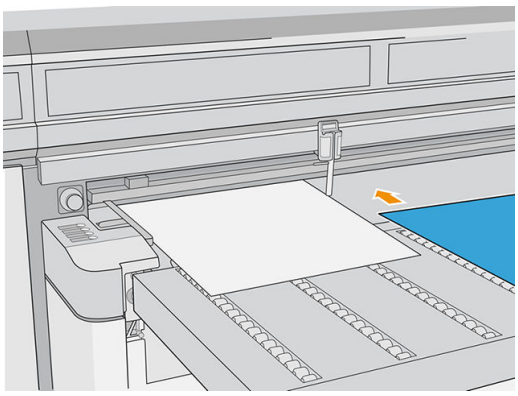


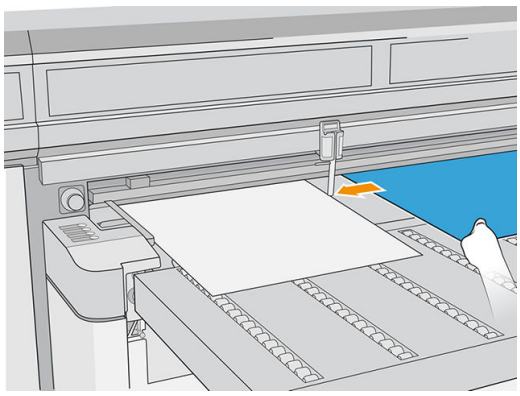
4. Rotate the pin handle, pull it down, and lock it.

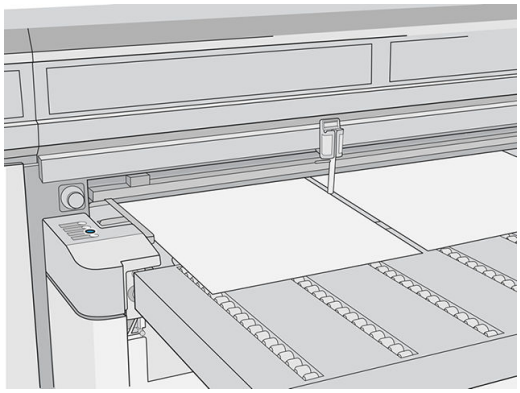




5. Place the next sheet on the substrate-advance belt, and align it against the front alignment bar and the pin.

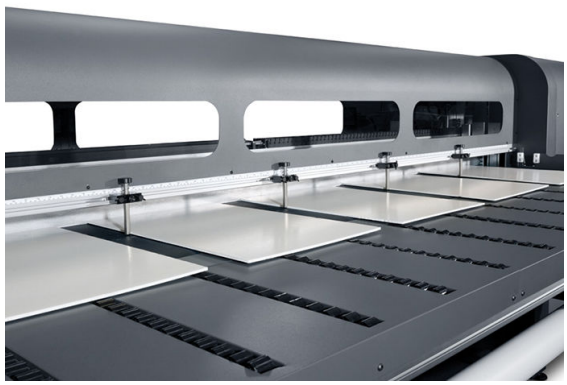






6. Repeat the above steps for as many sheets as you want to load.
7. Tap **Substrate ready** or press the equivalent quick-access button.

Multi-sheet N-up



Multiple-sheet N-up allows you to print more than one copy of a single job or multiple jobs on multiple sheets across the belt of either the same or different dimensions, using multiple rows of sheets until the job is complete. Use the built-in substrate alignment pins for quick positioning of the sheets across the printer's width. Align the left side of each sheet with one of the pins, with a small space from the right edge of the sheet to the next pin, to allow for variations in sheet dimensions. Alternatively, if you position the pins with zero clearance between the sheets and each pin, before each print be sure to raise the pins over the thickness of the sheets; otherwise the sheets could become skewed.

NOTE: When printing multi-sheet N-up on substrate that cannot be detected by the printer's substrate sensor (black, dark colored, reflective, or clear), the sheets in each row must be spaced equally.

This type of printing works best with an image that has wide margins on all four edges, but edge-to-edge printing is also possible by carefully matching the dimensions of the image(s) to the dimensions of the sheets. Margins can be defined by the RIP or can be set and adjusted on the printer.

To enable, select one of the **N-up sheet feed** options when loading substrate and have the number of sheets you intend to print across the width of the printer in position to be loaded. Sheets must not be more than 7.6 cm (3 in) apart from each other. Use the alignment pins if you will be printing multiple rows.

	Single image	Multi-image	Remaining copy	2-sided	Nesting
Single sheet	Yes (N copies)	Yes	Yes	Yes	Yes
Multi-sheet (same dimensions)	Yes (N copies)	Yes	Yes	Yes	No
Multi-sheet (different dimensions)	Yes	Yes	No	No	No

Multi-sheet printing (same dimensions)

Multiple copies of a **single image** can be made by setting the quantity to a number equal to or greater than the number of the sheets you loaded. The printer prompts you to load more sheets until the number of copies you specified has been printed. You can print any number of copies in this configuration, even if the total number does not divide evenly into the number of sheets per row. Only the last row may have a different number of sheets.

The **Multi-image** feature is enabled by selecting the **Print 2-sided / Multi-image N-up** button in the lower right corner of the **Stored Jobs** screen, then selecting **Multi-image N-up** in the following screen. Each of the jobs across the belt can be different jobs, but all jobs must have the same color set and resolution. Once the first job is selected, the printer displays jobs with a color set or resolution mismatch with a red border. If a different print mode is desired, or if separate jobs have different print modes but share the same resolution, a single print mode is changeable by selecting **Print mode** in the summary screen. Enter the number of image groups or 'rows' to be printed and tap **Proceed**.

Multi-sheet printing (different dimensions)

As with multi-sheet printing with the same dimensions, multiple copies of a **single image** can be made by setting the quantity to a number equal to or greater than the number of the sheets you loaded. Because sheets can be of different sizes, and the image of a single size, be careful about job alignment and overprinting onto the belt.

Again, as with multi-sheet printing with the same dimensions, the **Multi-Image** feature is selected from the **Stored Jobs** screen, following the same process. Because sheets can be of different sizes, and the images of various sizes, be careful about job size and alignment when selecting jobs.

Load flexible substrate

http://www.hp.com/go/latexRseries/load_and_print_flexible

To print on flexible substrates, you need the roll printing kit accessory; see Roll printing kit on page 281.

Using input/output spindles

1. Place a roll onto the spindle: see Place a roll onto the spindle on page 53.
2. Load a roll and spindle into the printer: see Load a roll into the printer on page 55.

NOTE: The table-top roll holder comes with the roll printing kit accessory; see Roll printing kit on page 281.

Place a roll onto the spindle

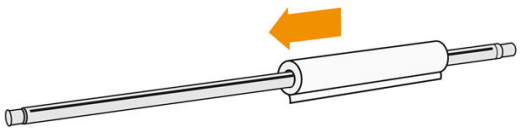
NOTE: Printing with a spindle requires an optional accessory; see Roll printing kit on page 281.

NOTE: Contact HP for the recommended third-party solutions for substrate lifter and core adaptors.

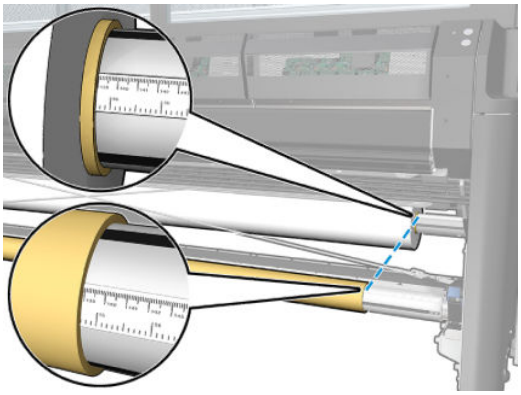
The spindle has a pneumatic connector at one end and a gear at the other.

1. Check that the gear is on the correct side.
2. Insert the spindle into the roll taking into consideration the winding direction.

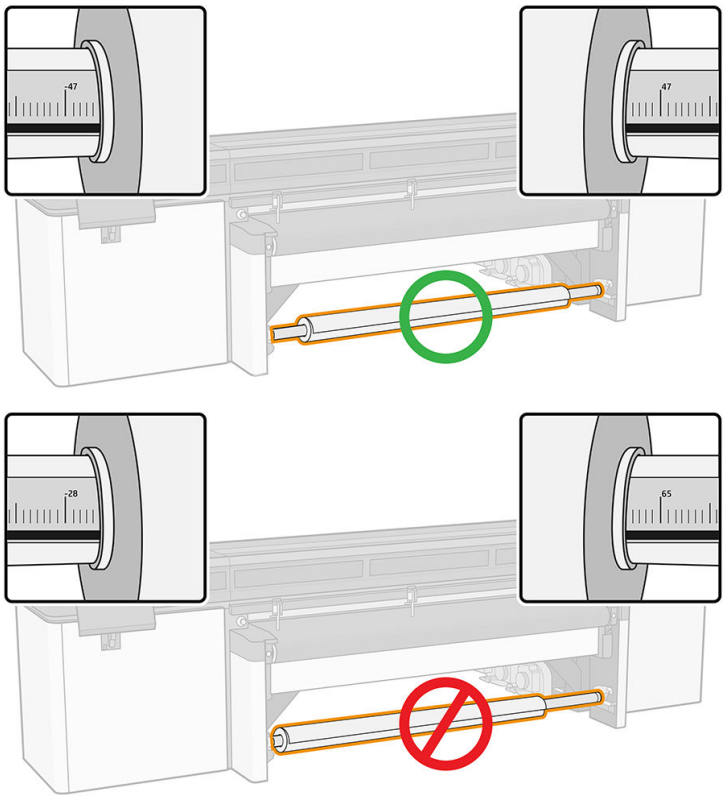
TIP: The spindle is quite heavy in order to ensure stiffness and so avoid skew and wrinkles, so two people are recommended for this operation.



3. Note the position of the end of the roll on the scale marked on both sides from the center of the spindle. The input and output rolls should be positioned identically on their respective spindles.



TIP: The rolls should be centered to reduce the risk of skew, wrinkles, and telescoping.



4. Connect the air gun to the pneumatic connector on the spindle, and inflate the spindle so that it cannot move inside the roll.

TIP: Before inflating, use the pneumatic gun to blow air around the valve area to remove any dirt.

WARNING! The air gun provided with the printer is only intended to inflate the spindle. When recommended to use for cleaning purposes, make sure to do so according to local regulations since additional safety provisions may apply.

TIP: If the substrate is telescoped on the input roll, there is a risk of substrate jams and damage to the printheads. Try to straighten the edges of the substrate to minimize telescoping on the input roll before loading it into the printer.

TIP: Check that the substrate is attached to the input core.

The roll is now ready to be loaded into the printer.

TIP: If you are a regular user of different substrate types, you can change rolls more quickly if you preload rolls of different substrate types on different spindles. Extra spindles are available for purchase.

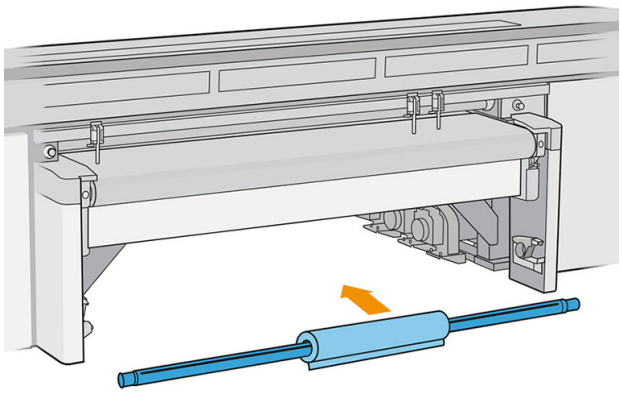
Load a roll into the printer

The objective when loading substrate is to get a uniform tension across its width and length to minimize the risk of skew, wrinkles, and telescoping.

The substrate roll is mounted on the input spindle and can be left to fall freely to the floor or collected on the take-up reel.

Each of the spindles has its own motor. The motors maintain tension on the substrate. Some vacuum is applied at the belt to keep the substrate flat. The substrate is moved forwards by the drive roller motor, and the vacuum at the belt prevents the substrate from slipping.

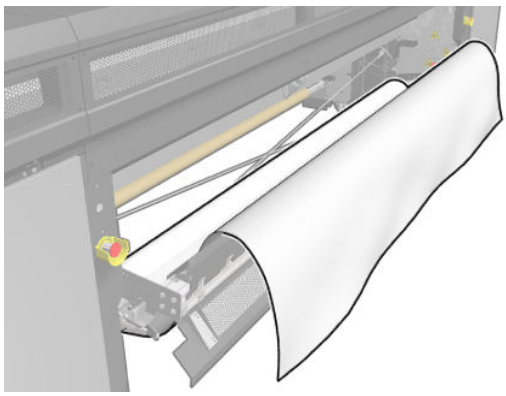
1. Bring the new roll on its spindle to the input side of the printer, with the geared end of the spindle on the left.



2. Rest the ends of the spindle on the platforms provided at the rear of the printer; plastic pads are provided to absorb the impacts.
3. Go to the Internal Print Server and tap **Load**, then select the correct configuration.
4. In the Internal Print Server, choose from the list of substrate types the type that you have loaded onto the spindle.
5. Check the auto-measurement options that you want the printer to use.

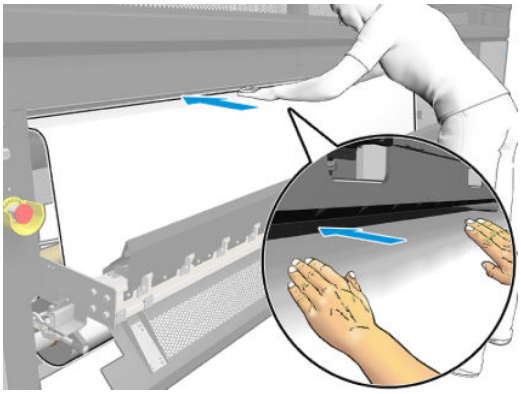
Loading substrate

1. Unwind a length of substrate.



2. Place it on top of the substrate-advance belt, with the leading edge of the substrate under the front alignment bar.

IMPORTANT: If the printer is waiting to print a job, it will start printing as soon as you put the substrate under the alignment bar.



TIP: Use the buttons on your left to advance the substrate, or hold the substrate on the substrate-advance belt until it reaches the correct position.

3. Go to the Internal Print Server and tap the **Load** button. The printer rotates the input roll to check its diameter, and it also checks the width of the roll, the winding direction, the substrate advance calibration, and the automatic de-skew process if selected (this takes about a minute).

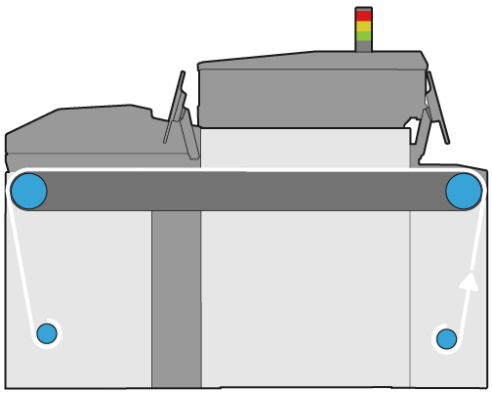
NOTE: Some substrates (such as transparent and dark substrates) cannot be measured by the printer in this way. In such cases, you will be asked to enter the Left Edge and Width fields yourself into the Internal Print Server. Use the ruler on the spindle to check these values.

4. When the printer is ready, if you agree with the information shown by the Internal Print Server, tap **Done**.

The printer is now ready to print.

Output options

- Allow the substrate to fall freely to the floor.
- Collect the substrate on the collector.



View information about the loaded substrate

Information about the loaded substrate is displayed by the Internal Print Server. From the main window, tap the **Substrate** application.

Substrate edge holders

Usage considerations

The purpose of the substrate edge holders is to prevent the substrate edges from lifting up and jamming while printing. If you experience this kind of problem while printing, you can try using the edge holders to overcome it.

Once the substrate edge holders are installed on the printer, the maximum width of the loaded substrate (rigid or flexible) is as follows:

- HP Latex R2000: 2440 mm (96 in)
- HP Latex R1000: 1545 mm (60.8 in)

IMPORTANT: To use substrate of this maximum width, you must raise the left and right alignment bars.

IMPORTANT: No more than five substrate edge holders can be placed in the print zone.

The maximum thickness of the substrate is 18 mm (0.7 in).

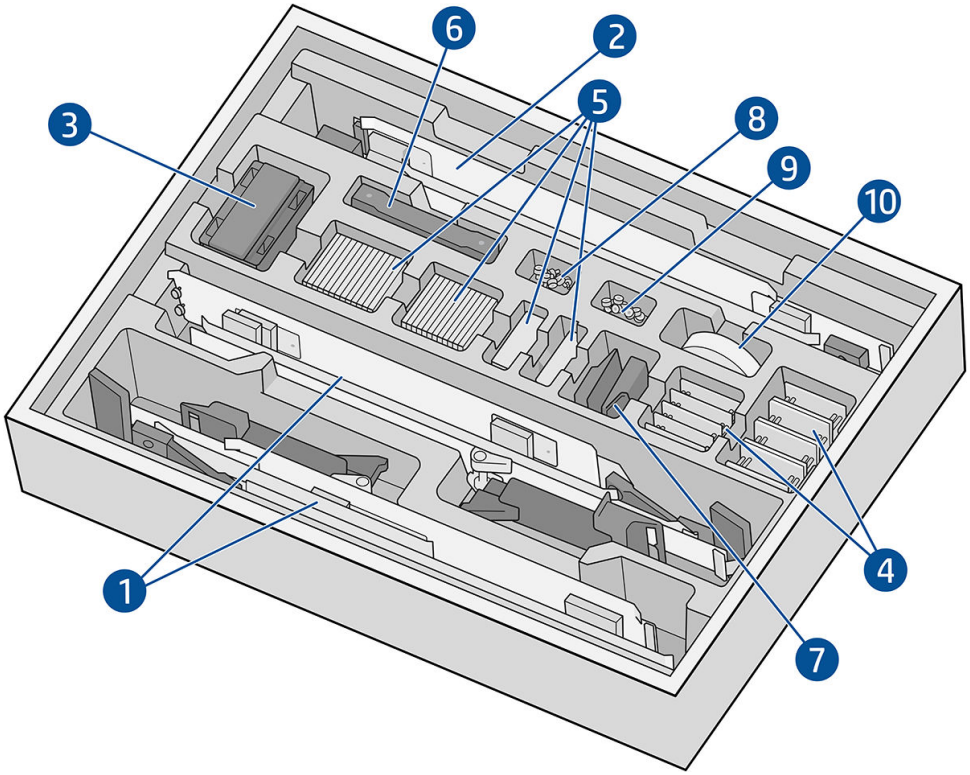
HP strongly recommends that you clean the edge holders regularly.

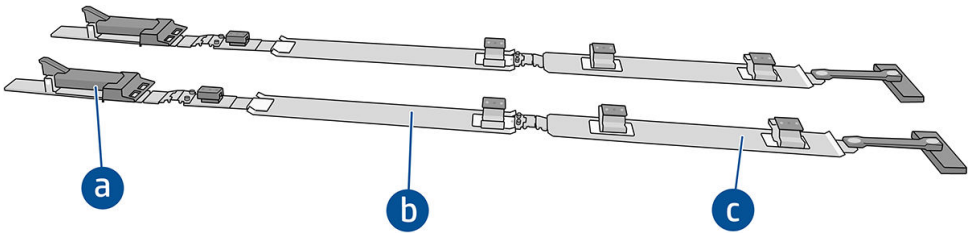
Substrate edge holders setup

The substrate edge holders are provided already assembled for use with flexible substrates. If you intend to use rigid substrates, you must install the print-zone modules suitable for rigid substrates.

See a video of edge holders setup and usage at http://www.hp.com/go/latexRseries/use_edge_holders.

Contents of the kit





1. Substrate edge holders assembled for flexible substrates:
   a. Input module
   b. Print-zone module, labelled ≤ 0.5 mm / ≤ 0.02 in
   c. Output module

IMPORTANT: Ensure that each print-zone module for flexible substrates has the protective film installed.

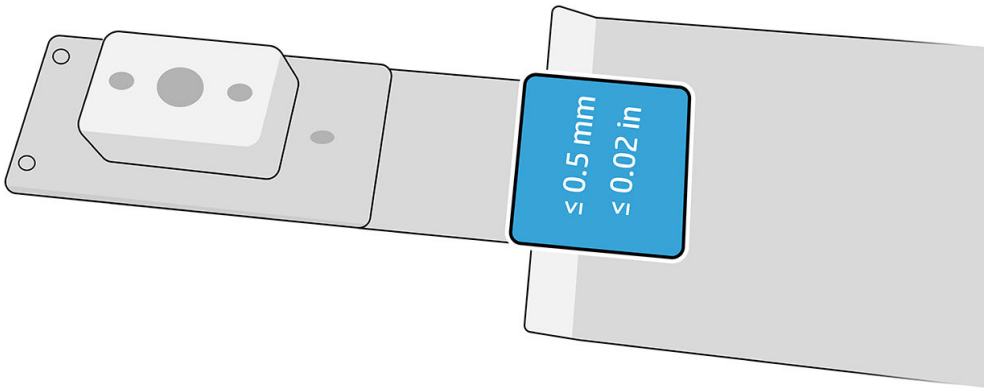
2. Print-zone modules, labelled > 0.5 mm / > 0.02 in (2)
3. Alignment-bar extenders (5)
4. Bases for shims
5. Shims
6. Extra straps
7. Back ends (2)
8. Screws and nuts
9. Screws and nuts
10. Extra-low-friction protective film

Setup procedure

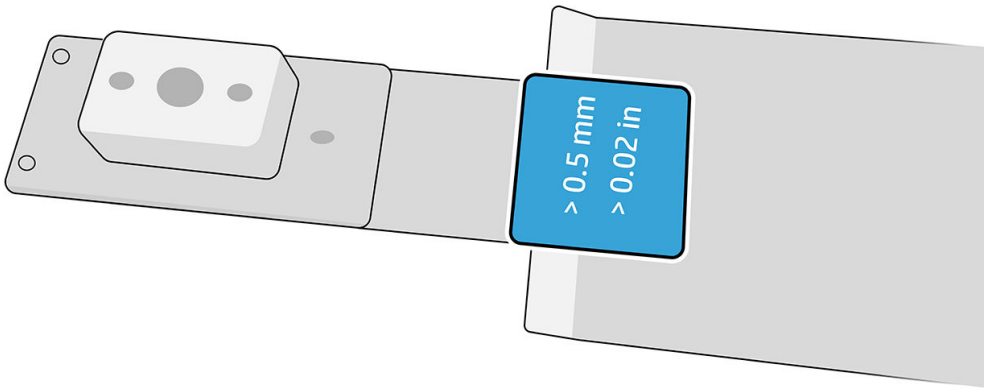
The edge holders must be assembled before use.

The parts shown in the illustrations are provided in the substrate edge holder kit. The print-zone module should be chosen according to the thickness of the substrate to be used. Look at the label on each print-zone module to identify the one you need.

Print-zone module for thin substrates

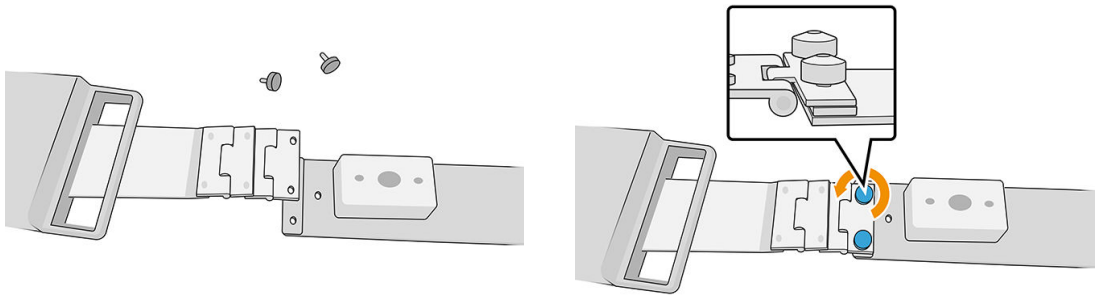


Print-zone module for thick substrates

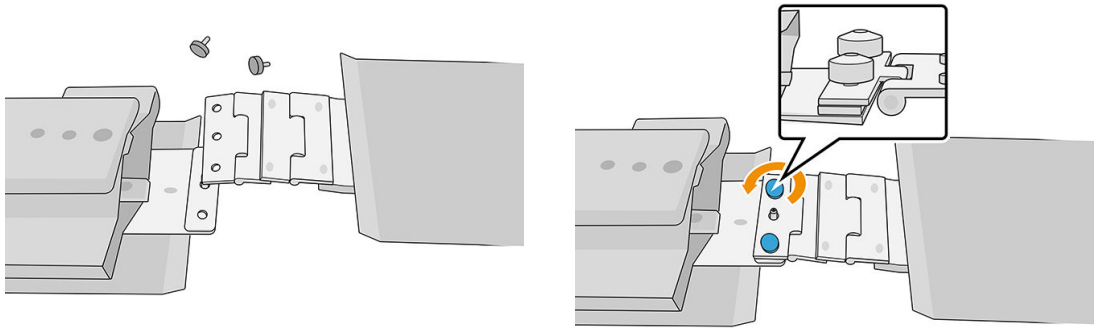


To assemble the edge holders, look for a flat surface on which to place the parts.

1. Pick up the print-zone module that you have decided to use.
2. Unfold the hinge.
3. Overlap an input module with the print-zone module.
4. Attach the two modules together with the screws provided.



5. Repeat the operation at the other end of the print-zone module, to attach it to the output module.



6. Repeat both operations to assemble the second edge holder.

Once the edge holders are assembled, they can be kept in the box provided.

IMPORTANT: If you are working with thicker substrates, there are shims to be installed on the edge holders that help you to handle them. See How to install shims on page 60.

Using the substrate edge holders

How to install shims

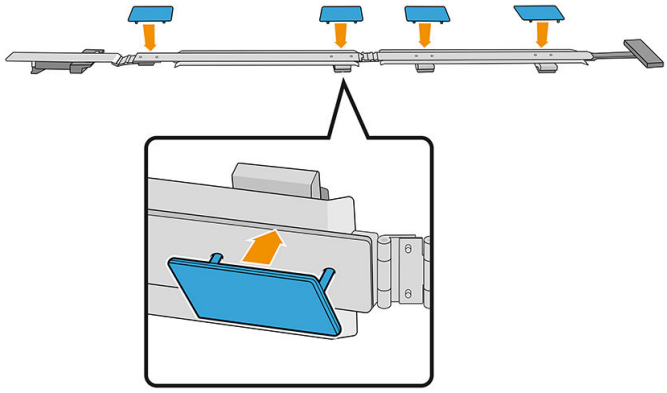
Shims are provided with the substrate edge holders kit so that the edge holders can accommodate thicker rigid substrates.

Before installing the shims, first decide on the height that the edge holders will need, depending on the thickness of the substrate. There is a base to which shims are added to reach the required height. Use the table below to decide which base and which shims you will need.

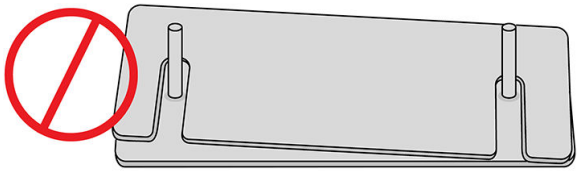
Substrate thickness	Shim thickness				Base
	0.5 mm (0.02 in)	1 mm (0.04 in)	3 mm (0.12 in)	5 mm (0.20 in)	
0–0.5 mm (0–0.020 in)					Not Needed
0.6–1.5 mm (0.021–0.063 in)					Not Needed
1.6–2.5 mm (0.064–0.098 in)					≤9.5mm / 0.374in
2.6–3.0 mm (0.099–0.118 in)	1				≤9.5mm / 0.374in
3.1–3.5 mm (0.119–0.137 in)		1			≤9.5mm / 0.374in
3.6–4.0 mm (0.138–0.157 in)	1	1			≤9.5mm / 0.374in
4.1–4.5 mm (0.158–0.177 in)		2			≤9.5mm / 0.374in
4.6–5.0 mm (0.178–0.196 in)	1	2			≤9.5mm / 0.374in
5.1–5.5 mm (0.197–0.216 in)			1		≤9.5mm / 0.374in
5.6–6.0 mm (0.217–0.236 in)	1		1		≤9.5mm / 0.374in
6.1–6.5 mm (0.237–0.255 in)		1	1		≤9.5mm / 0.374in
6.6–7.0 mm (0.256–0.275 in)	1	1	1		≤9.5mm / 0.374in
7.1–7.5 mm (0.276–0.295 in)				1	≤9.5mm / 0.374in
7.6–8.0 mm (0.296–0.314 in)	1			1	≤9.5mm / 0.374in
8.1–8.5 mm (0.315–0.334 in)			2		≤9.5mm / 0.374in
8.6–9.0 mm (0.335–0.354 in)	1		2		≤9.5mm / 0.374in

Substrate thickness	Shim thickness				Base
	0.5 mm (0.02 in)	1 mm (0.04 in)	3 mm (0.12 in)	5 mm (0.20 in)	
9.1–9.5 mm (0.355–0.376 in)		1	2		≤9.5mm / 0.374in
9.6–10.0 mm (0.377–0.393 in)			2		>9.5mm / 0.374in
10.1–10.5 mm (0.394–0.413 in)	1	1		1	>9.5mm / 0.374in
10.6–11.0 mm (0.414–0.433 in)		2		1	>9.5mm / 0.374in
11.1–11.5 mm (0.434–0.452 in)	1	2		1	>9.5mm / 0.374in
11.6–12.0 mm (0.453–0.472 in)			1	1	>9.5mm / 0.374in
12.1–12.5 mm (0.473–0.492 in)	1		1	1	>9.5mm / 0.374in
12.6–13.0 mm (0.493–0.511 in)			3		>9.5mm / 0.374in
13.1–13.5 mm (0.512–0.531 in)	1		3		>9.5mm / 0.374in
13.6–14.0 mm (0.532–0.551 in)				2	>9.5mm / 0.374in
14.1–14.5 mm (0.552–0.570 in)	1			2	>9.5mm / 0.374in
14.6–15.0 mm (0.571–0.590 in)		1		2	>9.5mm / 0.374in
15.1–15.5 mm (0.591–0.610 in)	1	1		2	>9.5mm / 0.374in
15.6–16.0 mm (0.611–0.629 in)		2		2	>9.5mm / 0.374in
16.1–16.5 mm (0.630–0.649 in)	1	2		2	>9.5mm / 0.374in
16.6–17.0 mm (0.650–0.669 in)			1	2	>9.5mm / 0.374in
17.1–17.5 mm (0.670–0.688 in)	1		1	2	>9.5mm / 0.374in
17.6–18.0 mm (0.689–0.708 in)		1	1	2	>9.5mm / 0.374in

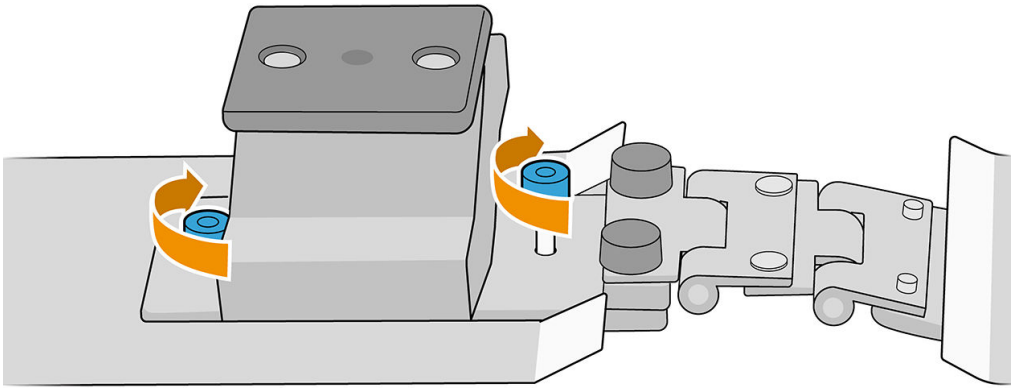
1. Attach each assembly (base and shims) to the bottom of the edge holder at the four points shown in the illustration below.



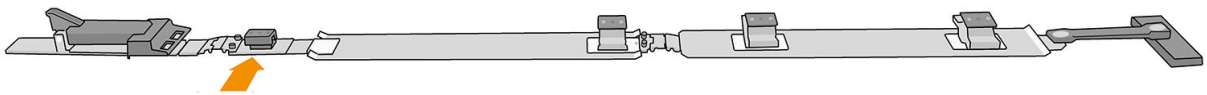
IMPORTANT: The shims should be aligned with each other.



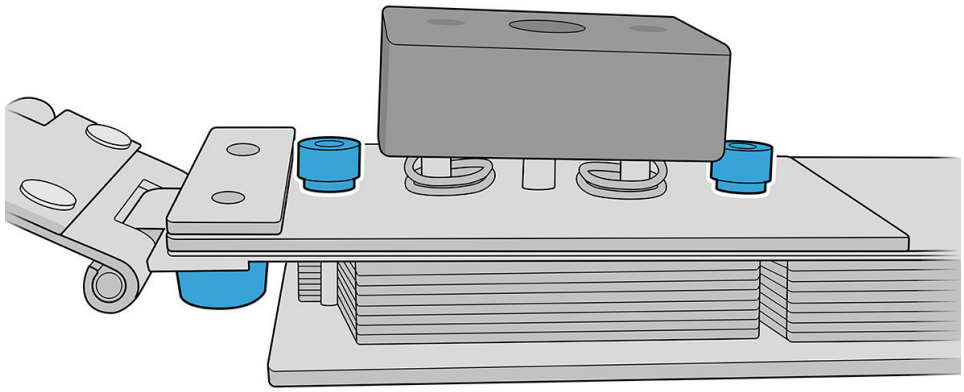
2. On top of the edge holder, fasten the assembly in place.



IMPORTANT: When the substrate thickness is up to 9.5 mm, the screws used when assembling the edge holders should be installed from above; when the substrate thickness is above 9.5 mm, screws should be installed from below, as shown in the illustration.



Substrate thicker than 9.5 mm

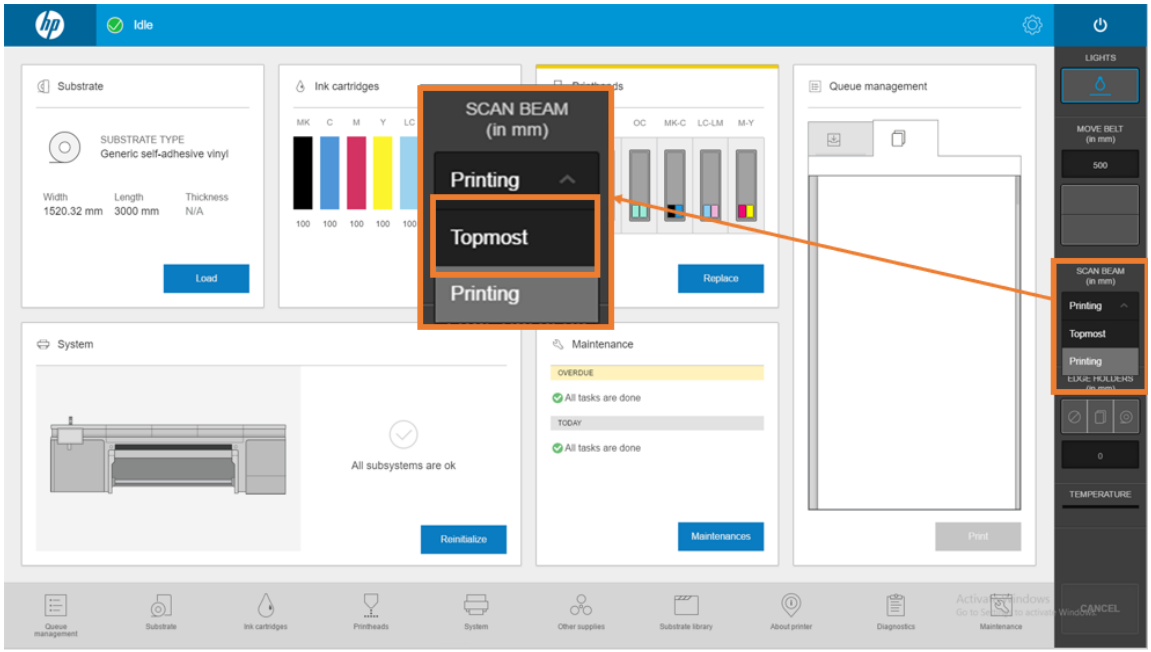


How to position the edge holders

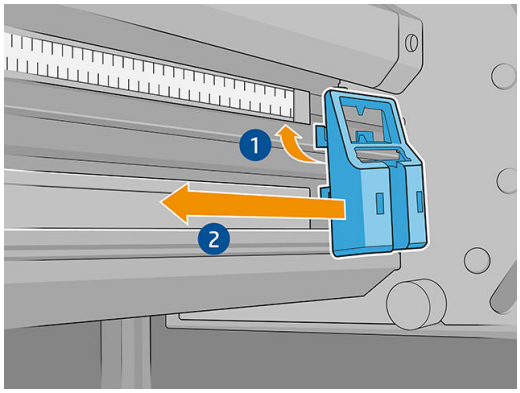
Use the substrate as a reference to position the edge holders.

Install the edge holders

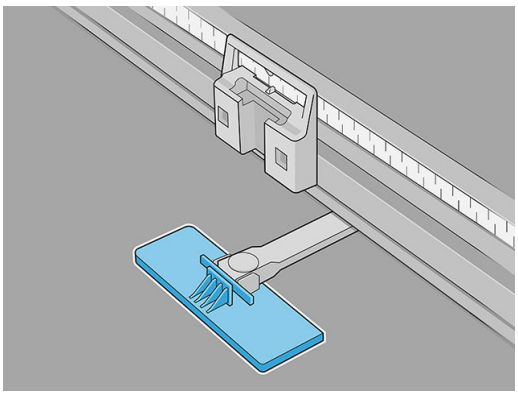
1. In the Internal Print Server, tap **Topmost** in the Scan Beam menu. This moves the scan-axis beam and the curing module to their highest positions.

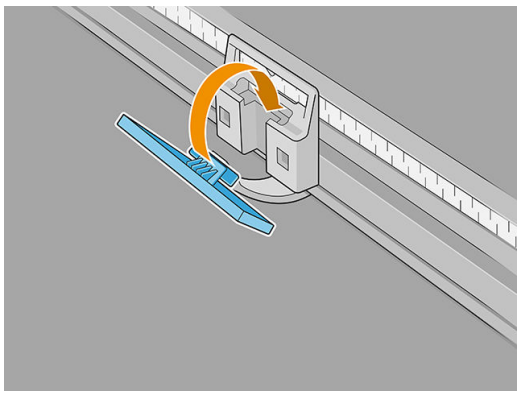


2. Make sure the substrate is loaded.
3. Place the edge holders on either side of the substrate.
4. Push down the cam until it reaches the belt.
5. Move the edge holders until each cam reaches the substrate.
6. Note the position of the edge holders, then go to the output side of the printer.
7. At the output side of the printer, install the back end at the ruler, inserting it by the edge and sliding it to the same position that you used on the input side of the printer.



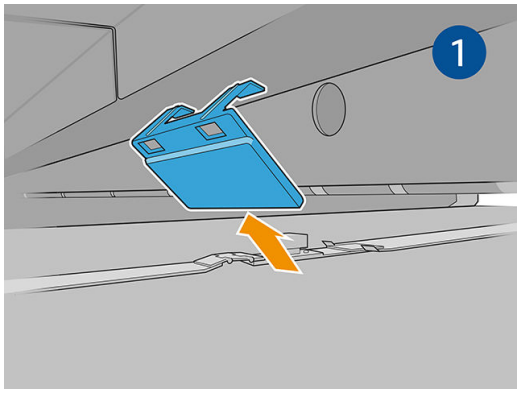
8. Pull the handle and insert it into the back end. Visually check through the print zone that the edge holders are straight when pulling the handle.

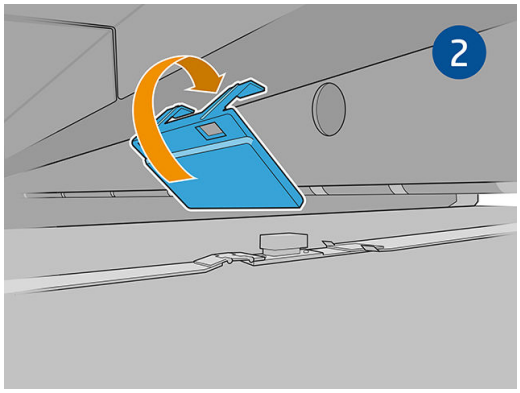




9. Take the alignment-bar extenders and install them on the alignment bar. Here is the installation process in detail:

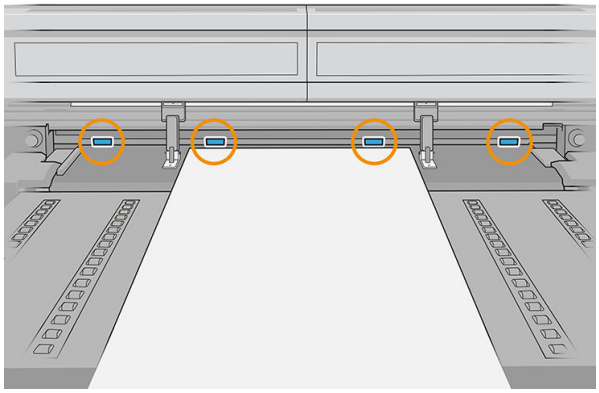
   a. Insert the flanges at the bottom edge of the alignment bar, then press at the top against the extension bar.





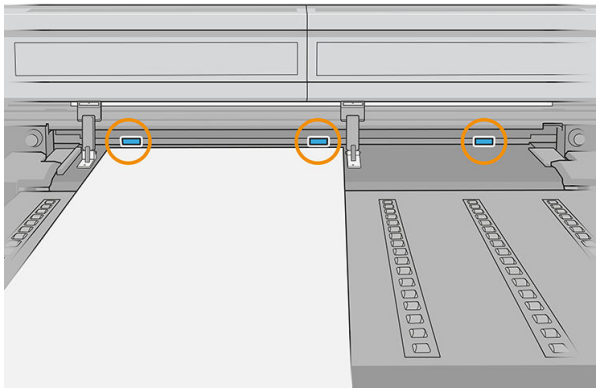
   b. Place two of the alignment-bar extenders at the edges of the alignment bar.

   c. Place two more alignment-bar extenders between each pair of edge holders that are going to be used.

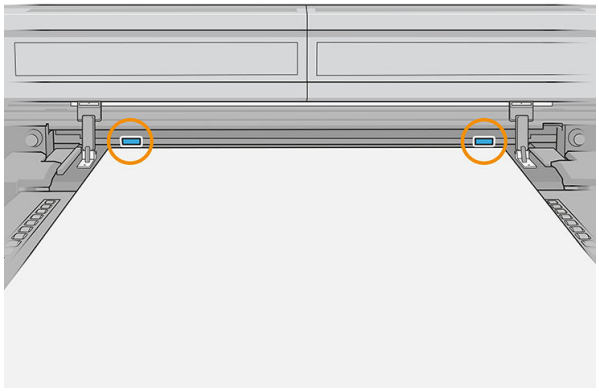


IMPORTANT: Do not place the extenders over the large holes in the alignment bar.

If an edge holder is at the edge of the alignment bar, then you do not need to place an extender at this edge.



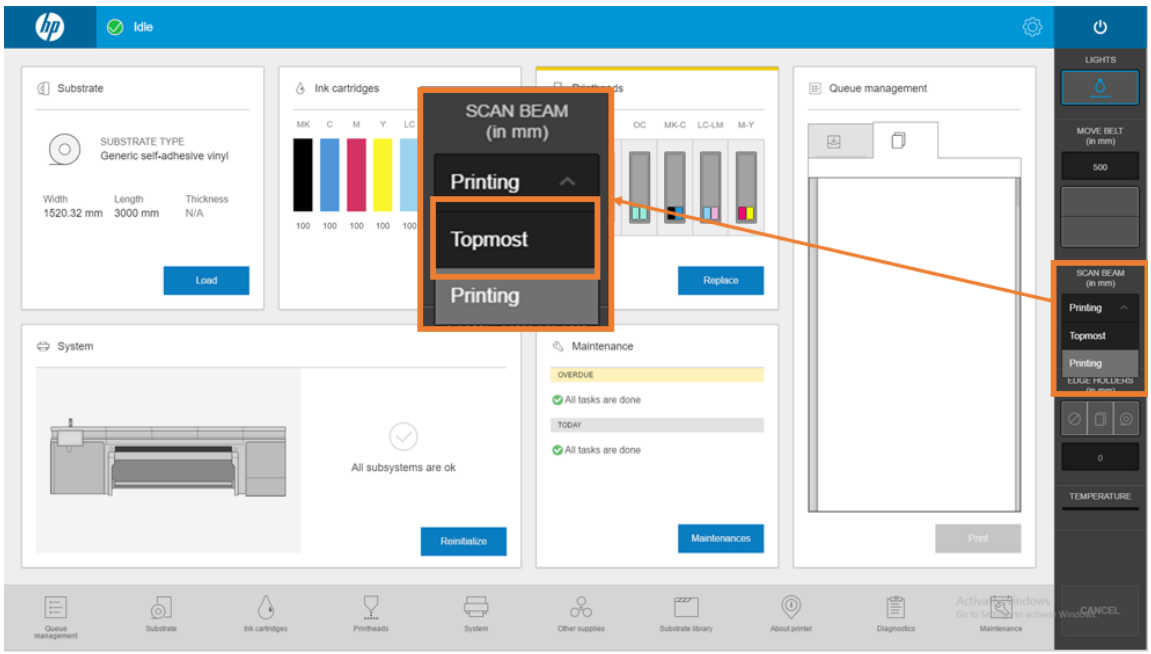
If the edge holders are placed at the edges of the substrate-advance belt due to the size of the substrate, install only two alignment-bar extenders as shown below.



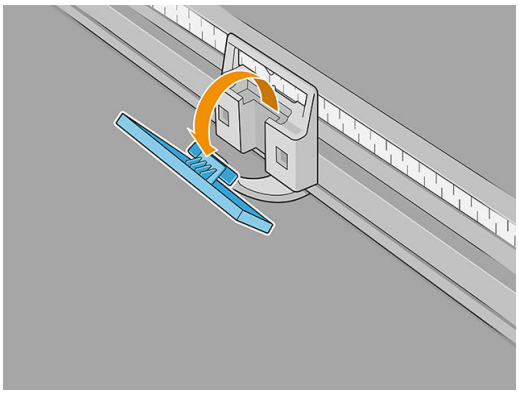
You can now print as usual.

Uninstall the edge holders

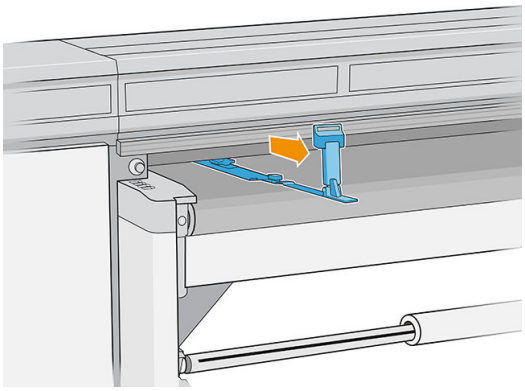
1. In the Internal Print Server, tap **Topmost** in the Scan Beam menu. This moves the scan-axis beam and the curing module to their highest positions.

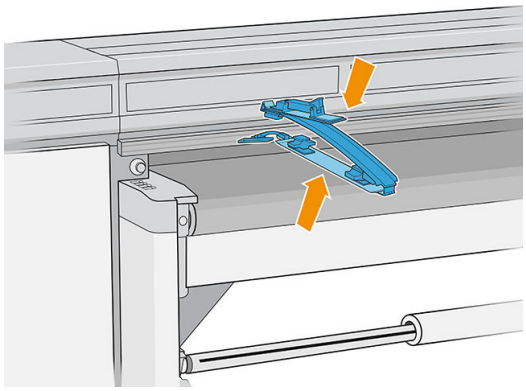


2. At the output side of the printer, unhook the handle from the back end.

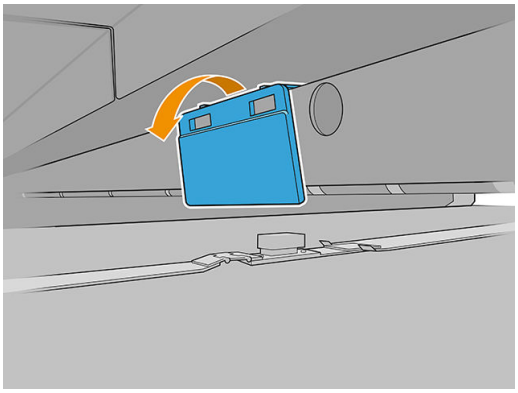


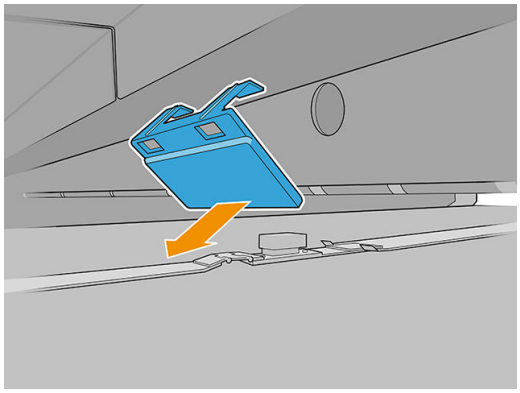
3. Go to the input side of the printer, pull the edge holder from the locator, and fold it as it comes out of the print zone.



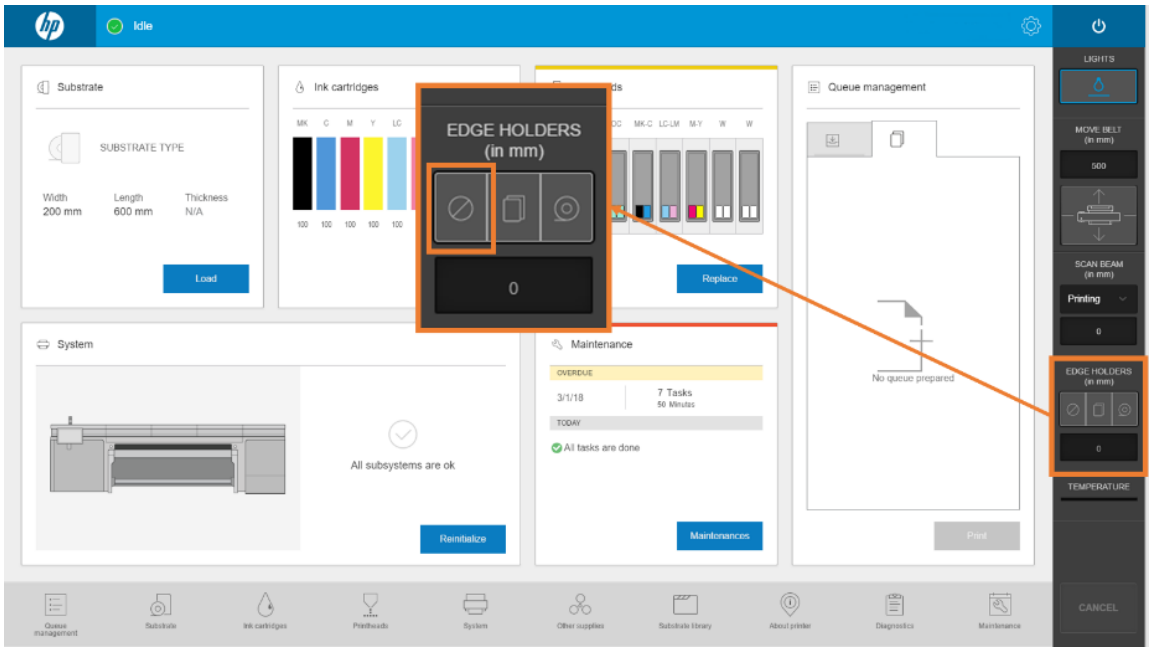


4. Uninstall the alignment-bar extender from the alignment bar. Remove it first from the top edge, then from the bottom.





5. In the Internal Print Server, tap the no-edge-holders option.



When you have uninstalled the edge holders, you can resume printing as normal.

Main maintenance tasks

Clean the substrate edge holders

Before installing the substrate edge holders, make sure they are clean.

Check the top and bottom surfaces, especially of the print-zone modules.

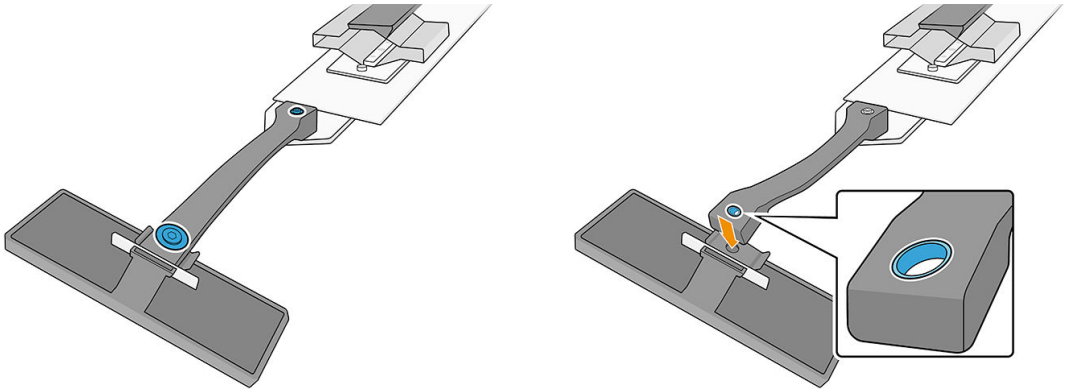
Clean the substrate edge holders with a lint-free cloth dampened with a general-purpose industrial cleaner, such as Simple Green. Remove any remaining soap foam with a dry cloth.

Replace a strap

The edge-holder straps must be replaced if broken or damaged.

1. Remove the two screws, then remove the strap from the edge holder.

IMPORTANT: Keep the screws and washers.



2. Take the new strap and install it using the removed screws and washers.

IMPORTANT: Only one of the two holes in the strap has a bushing. This is the one that should be attached to the handle.

Replace part of an edge holder

Any parts of an edge holder that are broken or damaged should be replaced.

To install a new part, see Substrate edge holders setup on page 57.

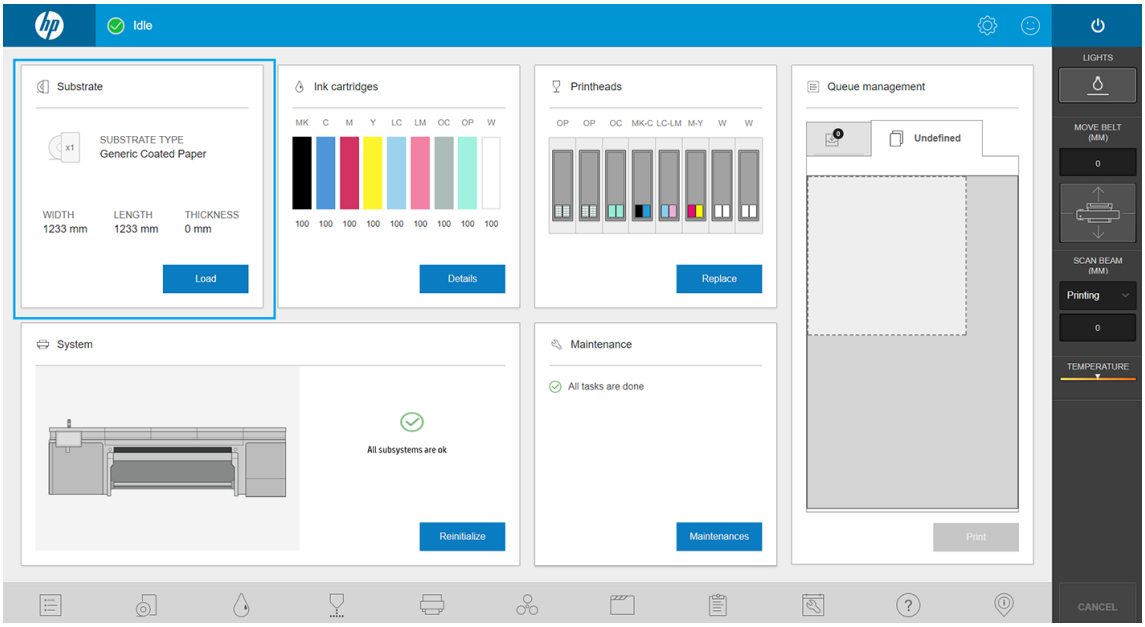
Replace the low-friction protective film

1. Remove the protective film from the print-zone module.
2. Clean the surface of the module.
3. Put back the protective film.

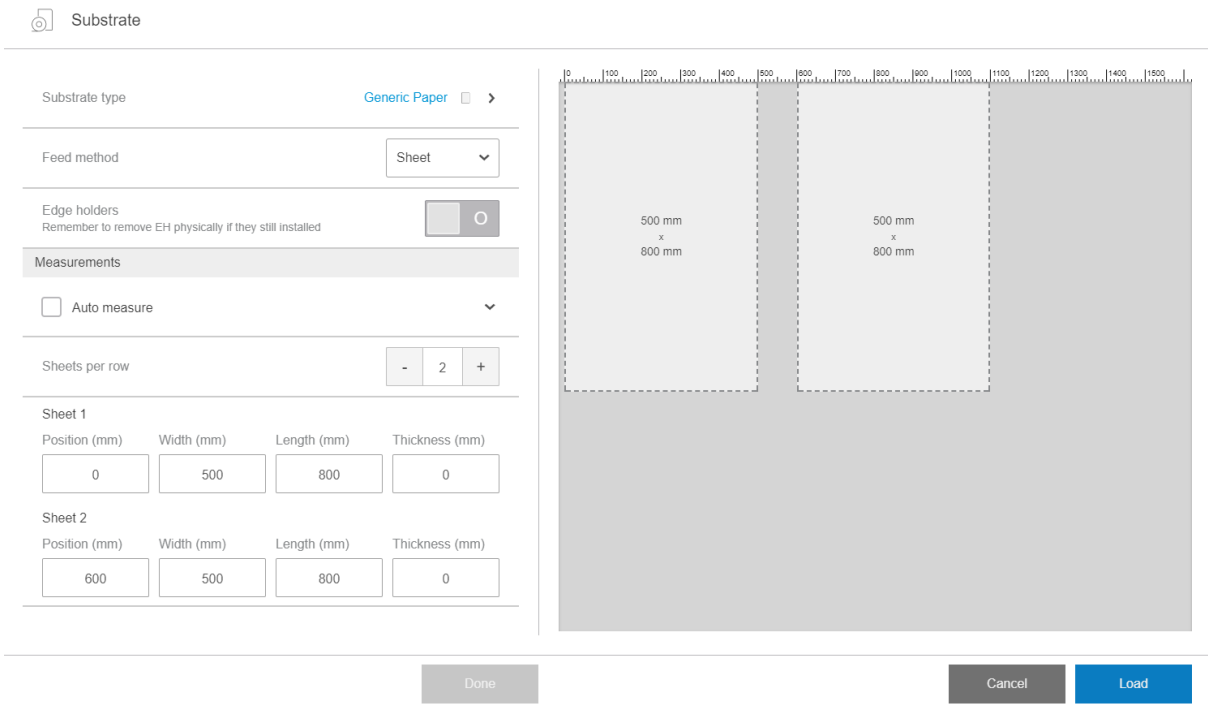
How to print

Follow these steps to prepare a job and print:

1. Prepare the job using your RIP software.
2. In the Internal Print Server, tap the **Substrate** application.



3. In the **Substrate** window, choose the substrate on which you intend to print, and set its parameters.



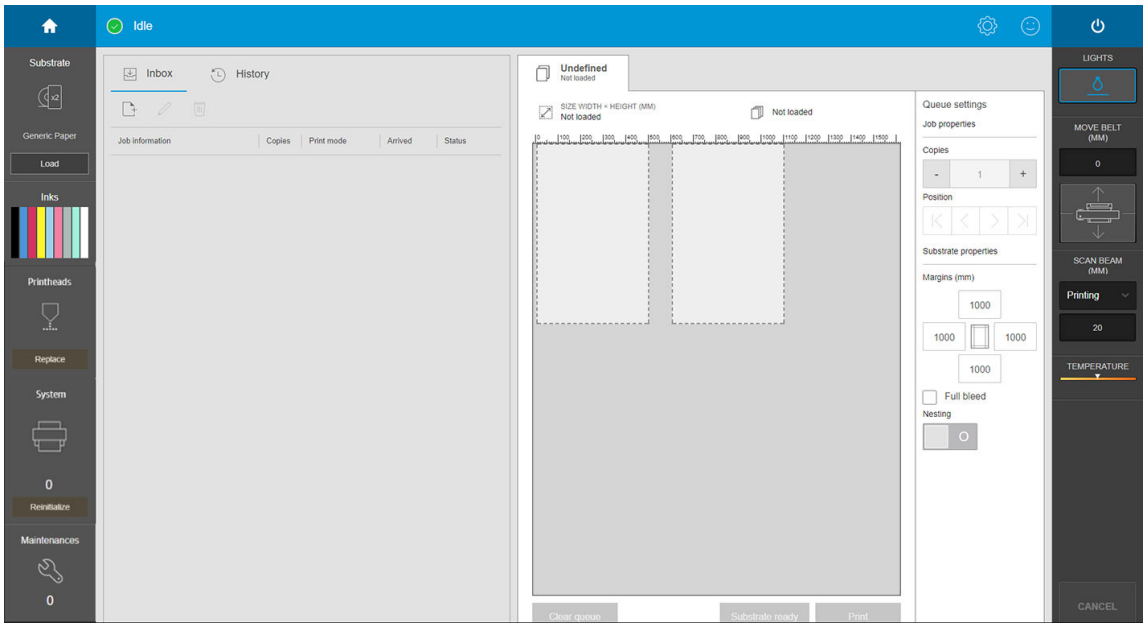
For more information, see Substrate configuration on page 43.

4. Place the substrate on the substrate-advance belt, using the front and side alignment bars. Once the substrate is correctly loaded, the printer will check and measure it.

   For more information on loading substrates, see Load substrate into the printer on page 46.

5. Tap **Print**.

6. Check the print preview in the **Queue Management** window of the Internal Print Server.



7. Tap **Print** to start printing.

Unload a roll

NOTE: Contact HP for the recommended third-party solutions for substrate lifter and core adaptors.

1. Check that the printing is not printing.
2. Go to the Internal Print Server and tap **Load/Unload**.
3. Cut the substrate.

   CAUTION: Be careful not to damage the substrate-advance belt when cutting the substrate.
4. Wind the substrate manually onto the output roll, if this has not been done automatically.
5. Open the two latches at each side of the spindles.
6. Remove the output roll from the printer.
7. Remove the spindle from the roll.
8. Rewind the substrate manually onto the input roll.
9. Open the two latches at each side of the spindles.
10. Remove the input roll from the printer.
11. Remove the spindle from the roll.

The printer is now ready for new substrate (rigid or flexible) to be loaded.

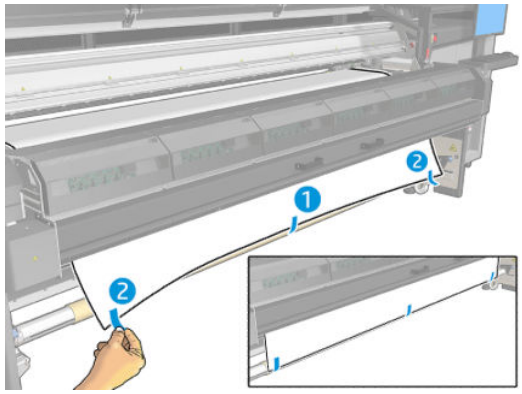
Take-up reel

NOTE: For the output roll, use a single empty core the same length as the input core. Do not place two or more shorter cores on the same spindle, which could cause substrate-advance problems.

NOTE: The take-up reel is deactivated during substrate loading and automatic de-skewing.

TIP: The spindle and a roll of substrate can be heavy. You are recommended to use a forklift or some other equipment to move it into position; otherwise, lift one end into the printer, and then the other end.

When the substrate is evenly tensioned and flat (no wrinkles or bumps), attach it to the empty core with adhesive tape. Tape it first in the center, and then at the left and right sides, making sure not to pull the substrate excessively or leave it wrinkled.



Use the physical buttons on the printer to manage the take-up reel, bearing in mind that the take-up reel is independent of the printer, and its movement is not linked to the movement of the substrate-advance belt.

Press a button once to set the direction of movement of the take-up reel. Press and hold down the button to advance the reel; it stops when you take your finger off the button.

The LED beside the button turns on to indicate which direction of movement is currently active.

6 Create and manage print jobs

- Add a new print job
- Substrate presets
- Use a new substrate
- Prepare the printer for a new substrate
- Add a substrate preset
- Edit a substrate preset
- Remove a substrate preset
- Set the carriage beam position

Add a new print job

Each print job must be created in your Raster Image Processor (RIP) and then added to the Internal Print Server.

When the RIP has generated a print job, its output folder will contain at least three files:

- An XML or JDF file containing job settings
- A low-resolution TIFF file for use in previews
- At least one high-resolution TIFF file containing the image to be printed

IMPORTANT: The output folder should be the shared folder on the Internal Print Server computer that was created during printer installation. The Internal Print Server cannot take files directly from the network because access would not be fast enough.

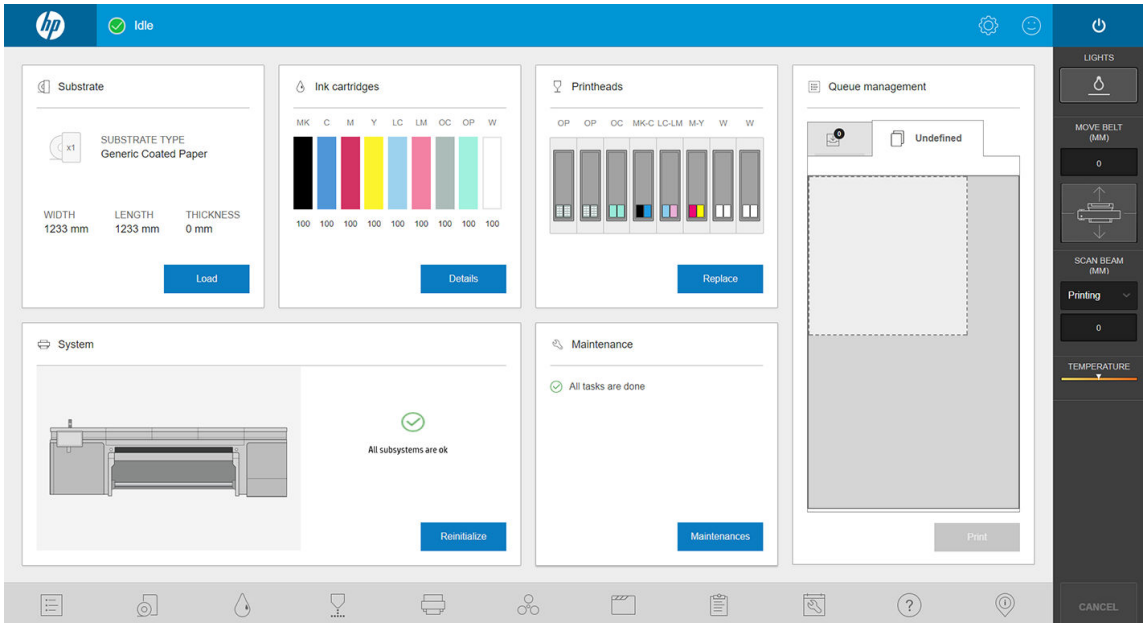
IMPORTANT: To make adding new jobs easier, HP recommends configuring the printer as follows:

- Create a shared folder (hot folder) in the printer's built-in computer (this is done when the printer is installed).
- Configure your RIP software to use the above hot folder as its output folder.

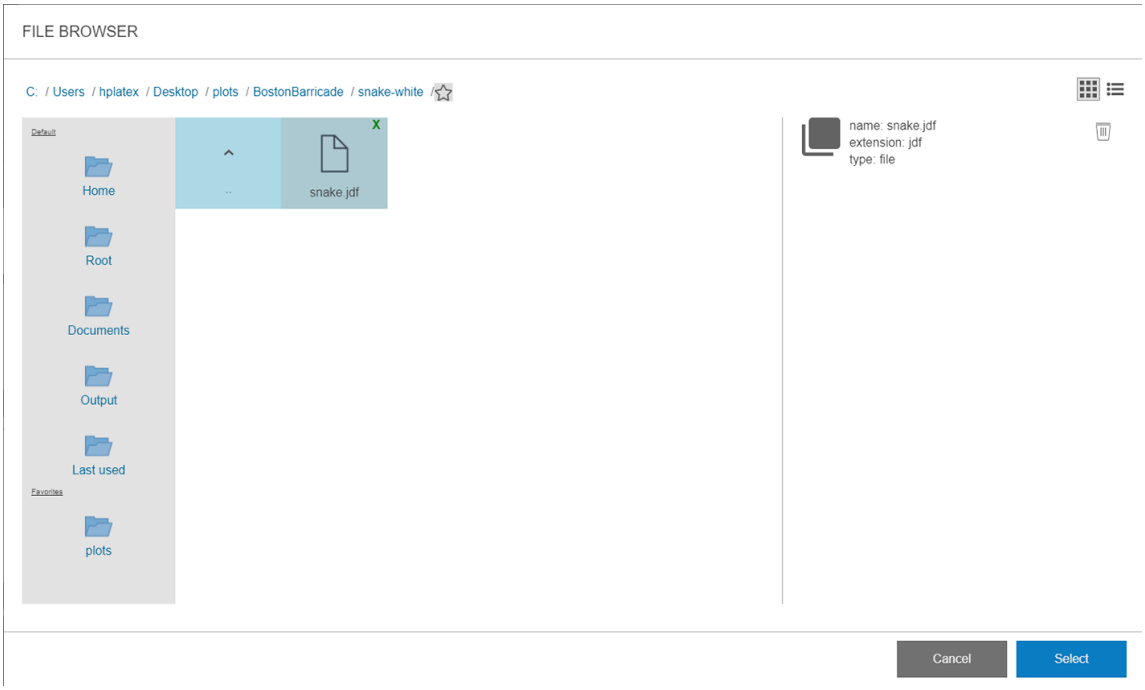
With this configuration, each job created by the RIP will be automatically added to the print queue.

To add a new job from any other location, follow these steps:

1. Go to the Internal Print Server and tap **Queue management**.



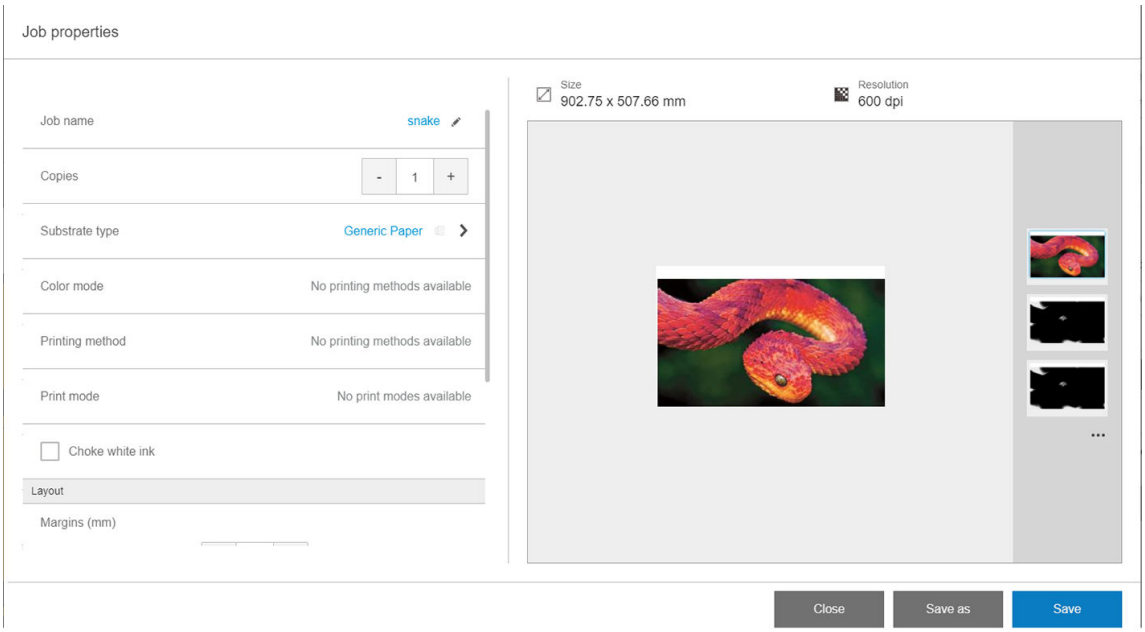
2. Tap . Navigate to the folder containing the print job files, and tap **Open** to import the job into the Internal Print Server.



TIP: You can sort the list by any column.

3. Your job is added to the corresponding slot of the job repository. Double-tap the job.

   The next dialog box displays information about the job.



   Tap **Save** if you accept the displayed properties. For more information about changing the job properties, see Job properties on page 45.

Substrate presets

Each supported substrate type has its own characteristics. For optimum print quality, the printer changes the way it prints on each different substrate type. For example, some may need more ink and some may require higher temperatures for drying and curing. So the printer must be given a description of the requirements of

each substrate type. This description is called a substrate preset. The printer is supplied with substrate presets for some specific substrate types, and also with presets for some generic types.

As it is inconvenient to scroll through a list of all substrate types available, your printer contains substrate presets for only the most commonly used substrate types.

Generic substrate presets cannot be modified, but you can create your own substrate presets (see Add a substrate preset on page 75), or search for further ready-made presets in the Media Locator: https://www.printos.com/ml/#/medialocator.

Use a new substrate

Whenever you load a new substrate type into your printer, you must choose a substrate preset for it.

1. If no specific preset is available, try using a generic preset in the same substrate category.
2. For full control of your preset, clone a generic preset and adjust the settings manually. See Edit a substrate preset on page 81. This is recommended for advanced users only.

Prepare the printer for a new substrate

1. Whenever possible, try to ensure that your printer is in an optimum state before you create a new preset: run any pending maintenance task, in particular printhead checks and alignment.
2. Stop the print queue and wait for the printer to finish the current job. No jobs should be sent to the printer until the new substrate preset is complete.
3. Load your new substrate. The process of loading a substrate into the printer has been designed to be completely independent of the substrate type. When loading, follow the correct procedure and ensure that the width and thickness of the substrate are specified, either automatically by the printer or by yourself. You may not experience the best possible results if there are significant differences between the specified and the actual width and thickness.

NOTE: For flexible substrates, you are recommended to use the roll-to-roll configuration when creating a new preset.

4. Choose a suitable carriage beam printing position: see Set the carriage beam position on page 83.

Add a substrate preset

http://www.hp.com/go/latexRseries/add_new_media

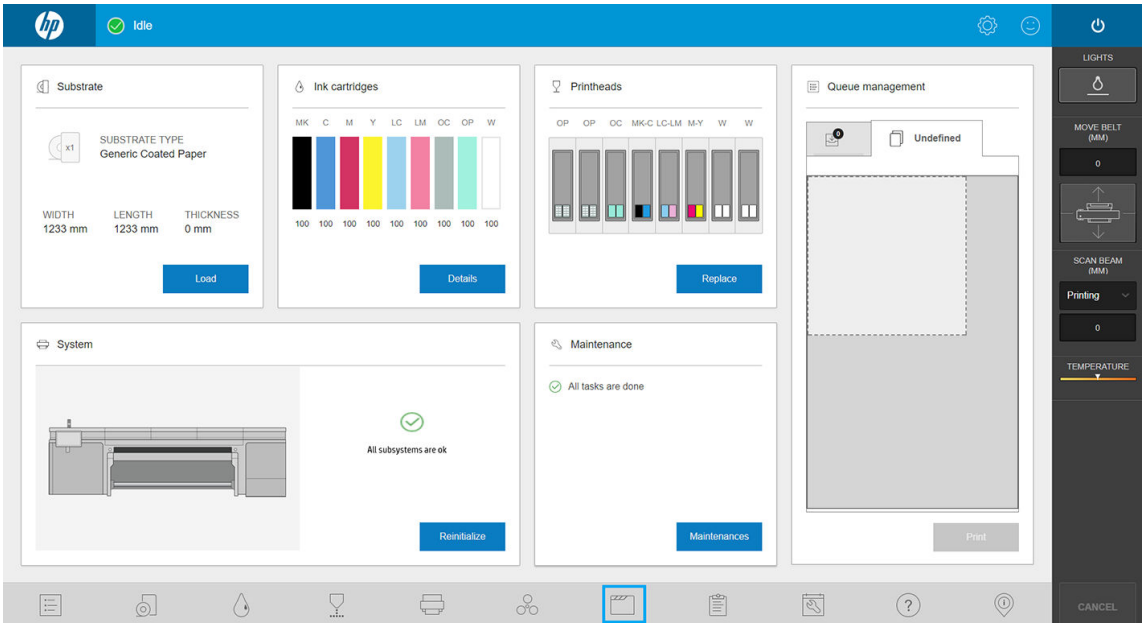
You may want to add a new substrate preset for various reasons:

- To assign a name of your own choice to the preset.
- To adjust the preset to the precise characteristics of your substrate.
- To adjust the preset to your intended use of the substrate, which may range from highest-quality printing to fast production output.

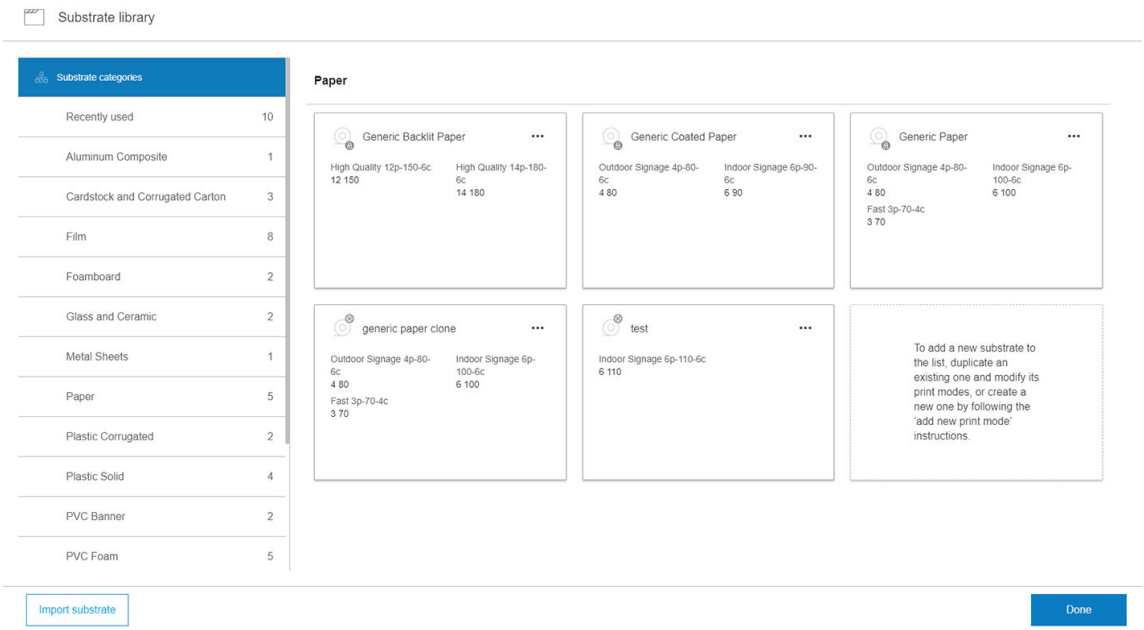
To clone a substrate preset, follow these steps:

1. HP strongly recommends loading the substrate for which the preset is intended into the printer before proceeding with this process.

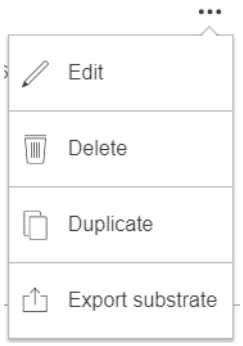
2. Go to the Internal Print Server and tap , among the icons at the bottom of the screen.



3. Select a preset from the Substrate Library.

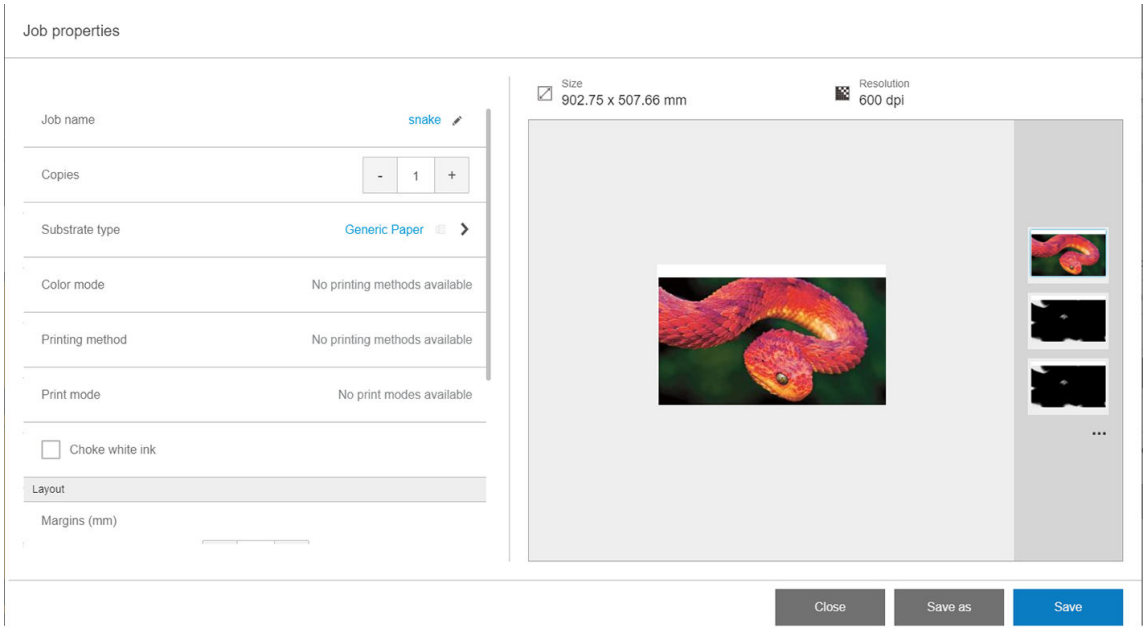


4. Tap **Duplicate** to clone the preset, and enter a name for the new preset.



5. Tap **Edit** to modify the settings of the new preset.

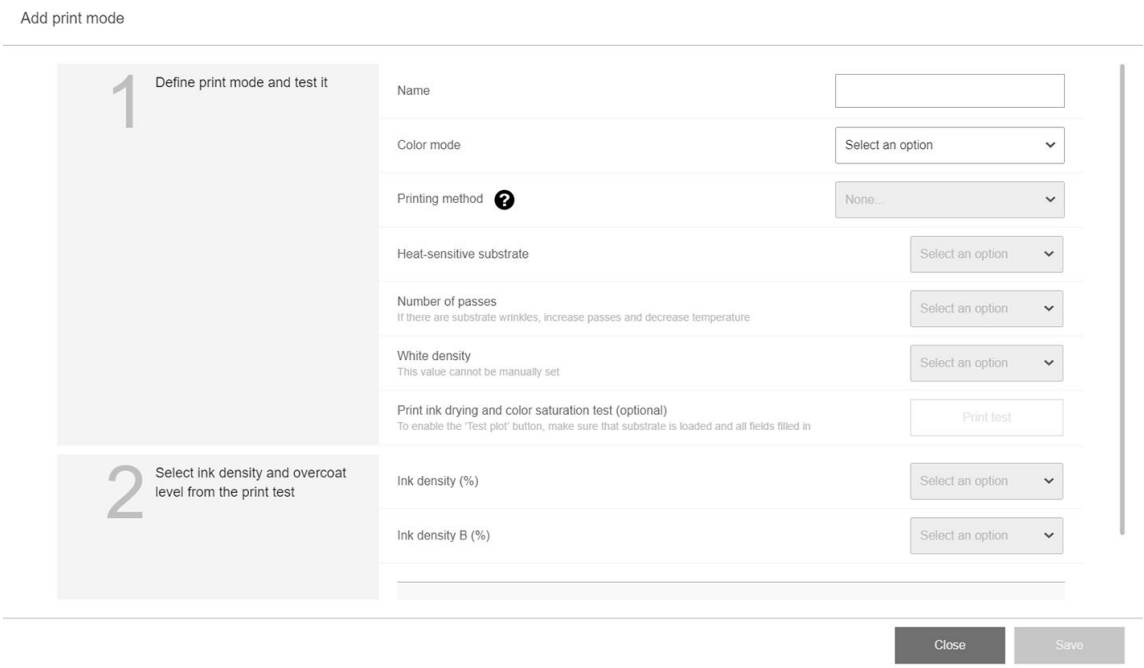
6. Tap the icon of the print mode that you want to modify; or tap **Add new print mode**. You can delete or change the name of any print mode; although you should keep at least one print mode.



NOTE: The printing method and number of passes in an existing print mode cannot be changed. If you want to change either one of them, create a new print mode.

NOTE: You are not allowed to create two print modes with the same printing method, number of passes, and ink density.

7. If you selected **Add new print mode**, you must now define your new print mode by editing its properties, and test it.



1. Define print mode and test it

- **Print mode name**: Choose a name to identify the newly created print mode.
- **Heat-sensitive substrate**: Enable this option if the substrate suffers some deformation at high temperatures. Enabling this option will increase the number of passes and reduce throughput, so use it only when needed.

NOTE: If you have not already loaded the substrate, you can load it now.

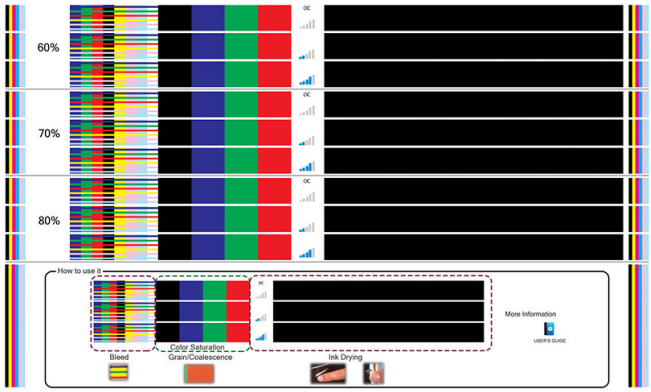
- **Color**: Choose the color mode from those available.
  - **CMYK** (4 colors)
  - **CMYKcm** (6 colors)
  - **CMYKcm+W** (6 colors + white)

    In this case, you must select the amount of white ink to use, and how to position the white layer with respect to the colored layer:

    - **Underflood**: The white layer is printed underneath the colored layer.
    - **Overflood**: The white layer is printed on top of the colored layer.
    - **Spot**: The white ink is printed at the same time and in the same way as the other inks.
  - **CMYKcmWCMYKcm** (sandwich)
    - No back light: Intended for dual-sided applications. Available only for frontlit substrates. You can see the print from both sides of the substrate.
    - Back light from printed side: Intended for day & night applications. Available only for backlit substrates. You will always see the print through the substrate. With a front light you will see side A; when the substrate is retro-illuminated you will see a mix of both sides.
    - Back light from not-printed side: Intended for day & night applications. Available only for backlit substrates. You will always see the print from the printed side, not through the

substrate. With a front light you will see side B (the printed side); when the substrate is retro-illuminated you will see a mix of both sides.

- **Number of passes**: Choose the number of passes, which is inversely related to throughput. More passes mean lower printing speed but allow a higher ink density and/or higher curing capacity. See Recommended print modes on page 82.
- Save the settings.
- Load the substrate.
- Tap **Print test** to print the ink drying and color saturation test.



By printing this test you will be able to assess different color densities and different OC levels, leading to differences in color saturation, scratch resistance, durability, and ink drying capacity in the same plot.

Follow the instructions on the print to assess the results:

– Check the bleeding and coalescence to identify the correct ink density.

– For the chosen ink density, test the overcoat level by scratching the print with your fingernail.

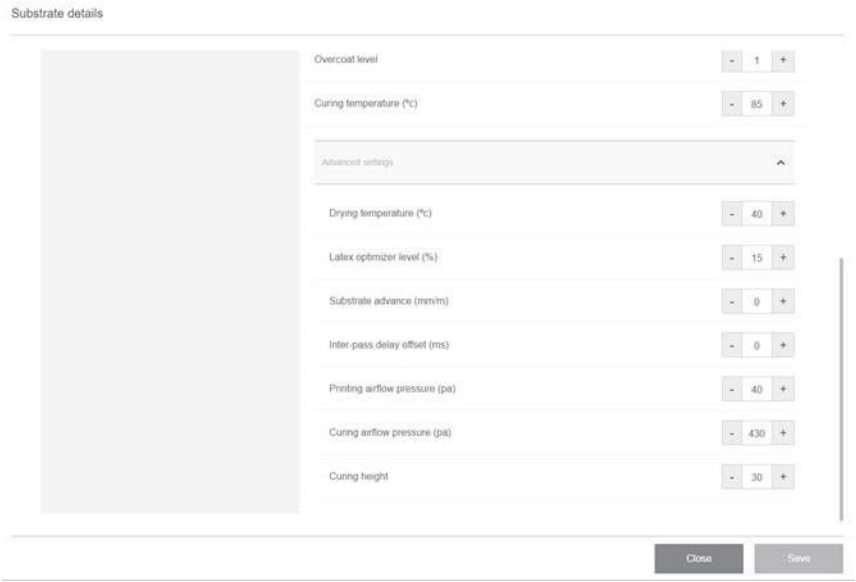
Move on to part 2 and adjust the values according to your observations of the test print.

2. Select preferred OC level and ink density

- **OC level**: To enhance durability, including resistance to rubbing or scratching, different levels of OC can be selected. A low OC level may be enough for prints that you intend to laminate; however, prints for long-lasting applications may require a higher OC level.
- **Ink density**: Ink density is related to color saturation. If you want more saturated colors, increase the ink density.

IMPORTANT: To change the ink density and overcoat level values, you can print the test described above. Check it and choose the number in the pull-down color-saturation menu that matches your preferences in terms of curing and drying.

If you cannot get satisfactory results, try changing the temperature and reprint. You can also change the advanced settings.



- **Curing temperature**: The curing temperature enables latex curing and film formation. You could increase the temperature if you see that the ink is not dry enough. Be aware that some substrates are heat-sensitive. An increase in temperature can cause substrate warping, deformation, or wrinkles.
- **Advanced settings**
  - **Drying temperature (°C)**: Increase print-zone heat to dry faster. Be aware that some substrates are heat-sensitive. An increase in temperature can cause substrate warping, deformation, or wrinkles.
  - **Latex optimizer level**: Increase optimizer level to reduce bleeding and coalescence, and increase the sharpness of the image.
  - **Inter-pass delay offset**: Add an interpass delay offset if the print is not sufficiently dry or sufficiently cured. It reduces the printing speed and throughput, for the same number of passes.
  - **Printing airflow pressure**: Increase drying pressure to dry a wider area. This improves drying performance.
  - **Curing airflow pressure**: Increase curing pressure to cure a wider area. This improves curing performance.
  - **Curing height**: Increasing curing height reduces curing performance but can help to avoid deformation of heat-sensitive substrates, as well as reducing printing defects caused by air-blowing orifices of the impinging plate.

  If you need to adjust some of these settings, see the recommendations of the table below. In the table you can find the recommended step (number of units to increase or decrease) for each adjustable setting in order to see the impact signal.

Setting	Unit	Recommended step change
Drying temperature	°C	5
Drying AF	Pa	10
Curing temperature	°C	5
Curing AF	Pa	100
Curing height	mm	5
PT	%	3
OC	level	0.5

Setting	Unit	Recommended step change
Inter-swath delay	ms	250
Vacuum	Pa	250

3. Perform color calibration, and optionally create an ICC profile

- **Automatic color calibration**: Color calibration is recommended to ensure color consistency. This process is automatic and takes around 15 minutes.

  Color calibration is supported only for frontlit white substrates. HP does not recommend attempting it with backlit, transparent, or non-white substrates.

- If you want to use your own ICC profile, you can create it at this point.

Apart from adding a new print mode, you can alternatively print the ink drying and color saturation test with the existing print modes, but for a new substrate. The workflow is similar to adding a new print mode.

For detailed information about print-quality troubleshooting, see Troubleshoot print-quality issues on page 243.

Edit a substrate preset

Optimize the preset for higher print speed

Action

Reduce the number of passes.

Possible risks and compensations

- **Risk:** Poor curing performance.
  - **Compensation 1:** Reduce the ink density by one or two levels for each level that the number of passes is reduced.

    Example: For most front-lit materials, 6-pass 100% ink > 4-pass 80% ink > 3-pass 60% ink.
  - **Compensation 2:** Slightly increase the curing airflow to eliminate minor curing artifacts.
  - **Compensation 3:** Increase the curing temperature if you choose not to compensate with the ink density.

    NOTE: This is feasible only with substrates that do not show thermal deformation defects at higher temperatures.
- **Risk:** When you reduce the number of passes, especially to 4 or fewer, some artifacts such as grain, bleed, coalescence, and banding may become visible. It is possible to compensate to some extent with the following settings:
  - **Compensation 1:** Reduce the ink density as described above.
  - **Compensation 2:** Increase the optimizer ink level in 2% steps for each level that the number of passes is reduced.

    Example: 6-pass 12% optimizer > 4-pass 14% optimizer.
  - **Compensation 3:** Increase the drying temperature in 5 degree Celsius steps.

    Example: 6-pass 50°C > 4-pass 55°C

Optimize for best print quality and/or widest gamut

Actions

- Use a 6-color ink set.
- Increase the number of passes.
- Increase the ink density.

Considerations

- A 6-color ink set enables smooth transitions; always use this option for best print quality.
- Use at least an 8-pass print mode for best print quality with frontlit substrates.
- Use a 14- or 18-pass print mode for best print quality with backlit substrates and textiles.
- When using a high number of passes, substrates can be saturated above 100% ink (example: 130% frontlit, 300% backlit). Higher ink densities may increase gamut and color saturation, and, in backlit materials, increase opacity of printed areas.

NOTE: This is highly substrate-dependent.

Optimize for ink consumption

Actions

- Reduce ink density.
- Use a 4-color ink set.

Considerations

- Reducing the ink density usually reduces the gamut and color saturation.
- A lower ink density may permit a lower number of passes.
- A 4-color ink set may reduce overall ink consumption, as the light cyan and light magenta inks are not used in printing.

NOTE: Some ink is still used from each printhead to maintain the health of the printhead.

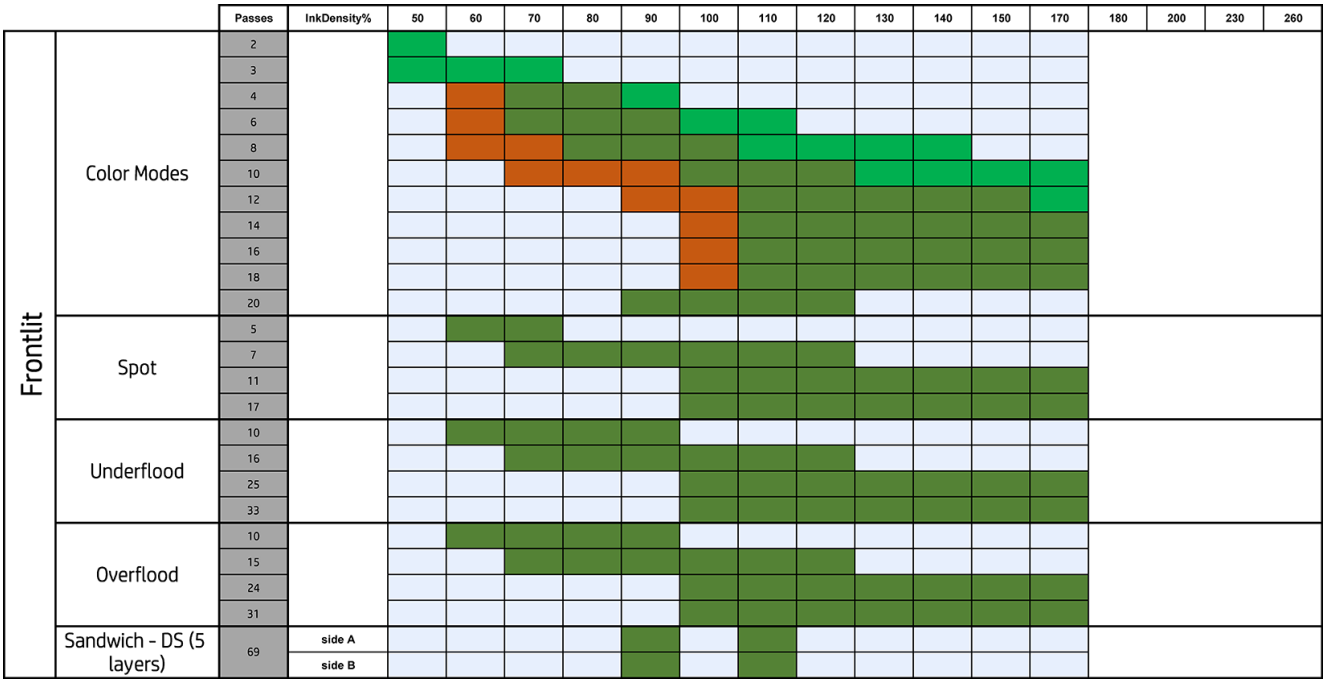
- A 4-color ink set is less resistant to some print-quality defects, such as contouring.

Recommended print modes

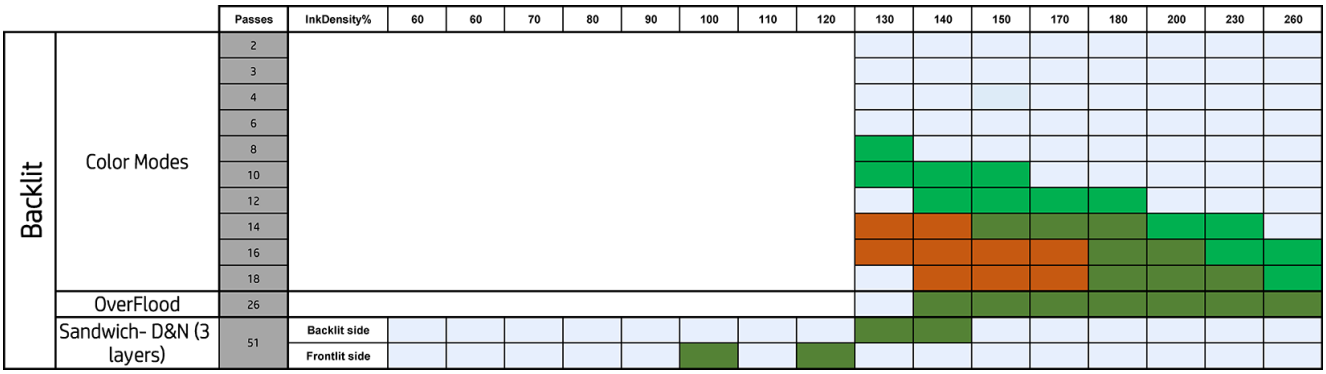
Key to colors

Acceptable for non-heat-sensitive substrates
Acceptable for heat-sensitive substrates
Acceptable for heat- and non-heat-sensitive substrates

Frontlit print modes



Backlit print modes



Adjust the printing workflow for optimum color performance

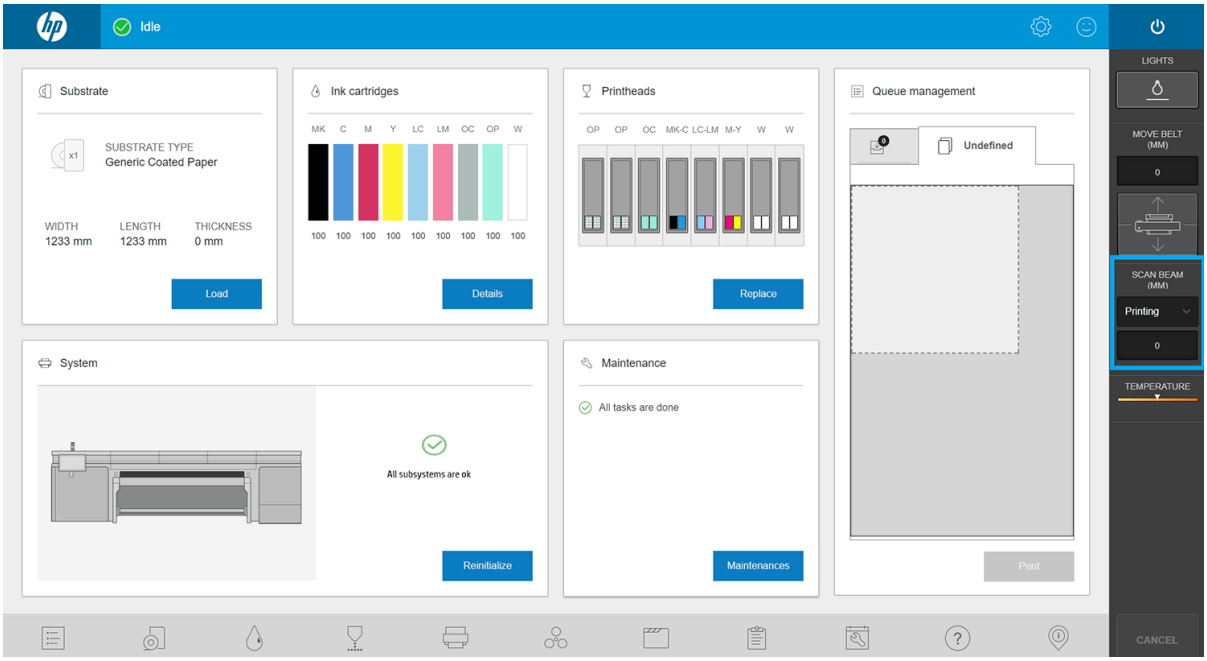
1. Check your substrate's color calibration status and calibrate it if recommended, by tapping **Substrate** > **Color calibration** in the Internal Print Server. See Printer calibration on page 114.
2. Create ICC profiles for your substrate; see your RIP documentation for instructions.

Remove a substrate preset

To remove a substrate preset from your printer, go to the Internal Print Server and tap , select the substrate to remove, and tap the trash icon. Then select the category and type of the substrate you wish to remove from a list of removable substrates.

Set the carriage beam position

The carriage beam position determines the distance from the printheads to the substrate-advance belt, usually set to the thickness of the rigid substrate loaded, or to zero for flexible substrates.



- The **Printing** position is set after loading the substrate, to the thickness measured by the printer when loading, or the manual thickness value entered by the user.
- The **Max height** position cannot be used for printing. It sets the height to maximum, to allow maintenance operations or facilitate manual interventions on the substrate-advance belt.
- Once a substrate is loaded, the value can be manually modified, changing its status to **Custom**, to correct the height upwards from its original **Printing** position. Custom values can never be lower than the ones measured or introduced during substrate load, to avoid head crashes against the substrate when moving the carriage.

  Manually raising the printheads may have adverse side effects on print quality.

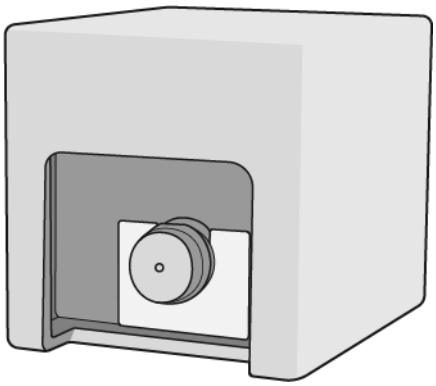
7 Handle the ink system

- Ink system components
  - Ink cartridges
  - Printheads
  - Printhead cleaning roll
  - Printhead-cleaning rubber blades
  - Aerosol filters
  - Left spittoon
  - Waste bottle
  - Distilled water tank
  - Drop-detector spittoon foam
- How to work with ink system components
  - Ink cartridges
  - Printheads
  - Safe mode
  - Replace the components of the printhead cleaning roll kit

Ink system components

Ink cartridges

Ink cartridges store the ink or other fluids that are connected to the printheads, which deposit the ink on the substrate.



Each cartridge contains HP Latex Ink, and consists of a bag within a recyclable cardboard box.

There are two kinds of printheads:

- Optimizer, for use with optimizer ink
- Universal, for use with all other inks: black, cyan, magenta, yellow, light cyan, light magenta, overcoat.

If you have the white upgrade kit, you will have three extra printheads:

- Two white printheads
- One optimizer printhead

⚠ CAUTION: Observe precautions when handling ink cartridges because they are ESD-sensitive devices (see the Glossary on page 333). Avoid touching pins, leads, and circuitry.

NOTE: Dynamic security enabled printer. Only intended to be used with cartridges using an HP original chip. Cartridges using a non-HP chip may not work, and those that work today may not work in the future. More at: http://www.hp.com/go/learnaboutsupplies.

NOTE: This printer is not designed to use continuous ink systems. To resume printing, remove any continuous ink system and install genuine HP (or compatible) ink cartridges.

NOTE: This printer is designed for ink cartridges to be used until they are empty. Refilling cartridges prior to depletion might cause your printer to fail. If this happens, insert a new cartridge (either genuine HP or compatible) to continue printing.

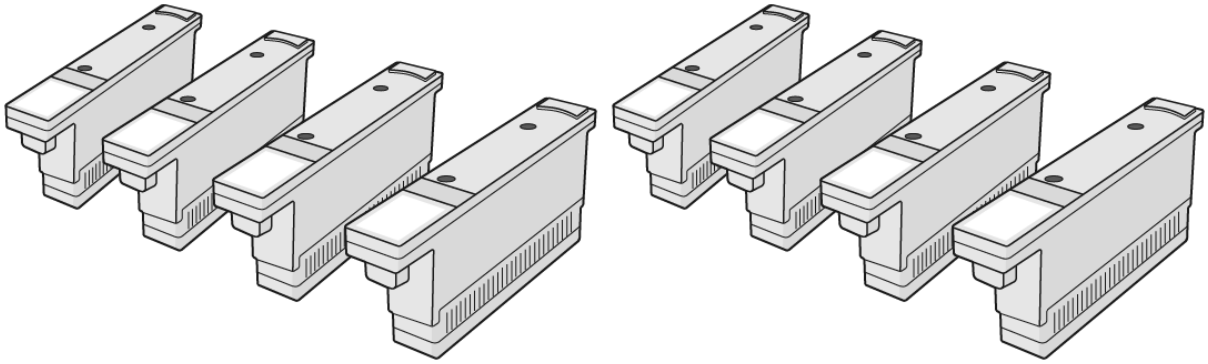
If pressure is put on a cartridge while it is connected to the printer, the pressure is transmitted to the ink pressure sensor, which may break; in which case ink may leak from the cartridge. To avoid such ink leaks, avoid putting any pressure on cartridges while they are connected to the printer. In particular:

- Always disconnect cartridges from the printer before handling them.
- Never place anything heavy—more than 1 kg (2.2 lb)—on top of a cartridge.
- Take care not to drop a cartridge.
- Do not try to force the last of the ink out of an almost-empty cartridge by pressing the ink bag inside the cartridge.

Cartridges should be replaced on reaching the Warranty Ends date printed on the box.

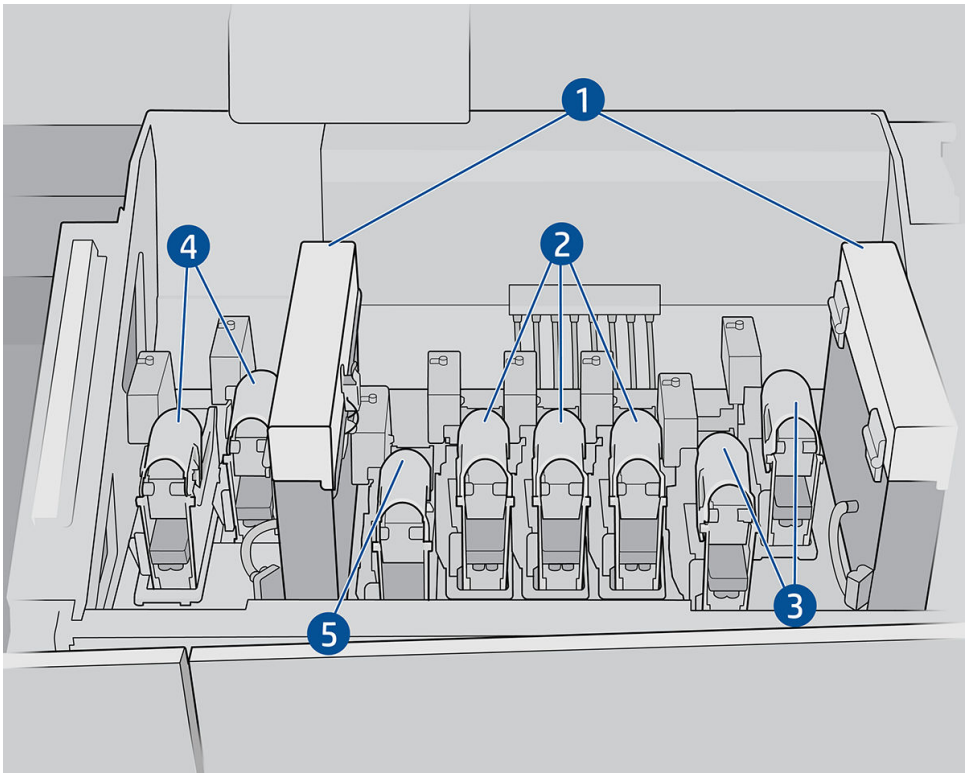
Printheads

The printheads take ink from the ink cartridges and deposit it on the substrate.



⚠ CAUTION: Observe precautions when handling printheads because they are ESD-sensitive devices (see the Glossary on page 333). Avoid touching pins, leads, and circuitry.

The printer's six-color writing system uses three dual-color printheads with a total of 31,680 nozzles, and an HP Latex Optimizer printhead with 10,560 nozzles.



1. Aerosol filters
2. Color printhead latch
3. White printhead latch
4. Optimizer printhead latch
5. Overcoat printhead latch

There are three categories of printheads. When put into the printer for the first time, you can connect each printhead to a slot of the appropriate category:

- Universal printheads. These printheads, when brand new, can be connected to any slot except the optimizer and white slots, becoming committed to that color once purged and ready to print.
- Optimizer printheads can be put into optimizer slots only, and can never be swapped to other slots, whether new or used.

TIP: When you plug a printhead into a slot for the first time, HP recommends marking that printhead visibly to identify its position, as the printhead can be unplugged at any moment for various reasons, but it will only work again if put in the same slot as before.

If you have installed the white upgrade kit, you have an additional category:

- White printheads can be put in white slots only, and can never be swapped to other slots, whether new or used.

Printhead cleaning roll

The printhead cleaning roll is a roll of absorbent material used in the normal operation of the printer to clean the printheads periodically (at the beginning and end of printing, on printhead check and clean, and so on). This helps the printheads to deliver continuous ink and maintain print quality.

The roll should be replaced whenever it is used up, to avoid damaging the printheads. The frequency of replacement depends on your use of the printer. The average life of a single roll is 20 liters of ink, but significant variability is expected, depending on how you use the printer.

An alert is displayed when 95% of the roll has been used. You can choose to replace the roll at any time. The printer will not print when the roll has been 100% used.

If there is not enough of the roll to start a new job, the printer cancels the job.

To change the printhead cleaning roll, see Replace the printhead cleaning roll on page 108. The printhead cleaning kit can be ordered in the normal way.

TIP: You should not touch the printhead cleaning roll except when you need to replace it. Any interference with the roll may prevent the printer from keeping track of roll usage, in which case you may see spurious error messages, and a printing job may be canceled unnecessarily. When you need to replace a roll, always follow the instructions of the Internal Print Server.

Printhead-cleaning rubber blades

The printhead-cleaning rubber blades are used to wipe the printhead nozzles plate in every carriage pass. The printer uses two blades on the right (hard and soft), and one blade on the left (the same hard blade as the one used on the right). Each blade has a limited life, and you should replace them whenever the printer prompts you to do so. Whenever a blade is replaced, the printer calibrates its height with respect to the undercarriage, for optimal performance.

The left blade should be replaced twice as often as the cleaning roll, and the right blades approximately every 750,000 carriage swaths. The replacements are automatically prompted by the printer. Every time a new blade is mounted in the printer, its height with respect to the scan-axis undercarriage must be calibrated using the appropriate diagnostic test from the Internal Print Server. Blades are automatically recalibrated during use to compensate for wear.

Aerosol filters

The printheads produce many fine droplets of ink, most of which are placed accurately on the substrate. However, a small proportion of these droplets escape sideways; the two aerosol filters are placed on either side of the printhead carriage to intercept them.

The filters should be changed every time the printhead cleaning roll is replaced. They are provided with the printhead cleaning kit.

Left spittoon

The left spittoon is a rectangular piece of foam that allows the printhead nozzles to be refreshed at the left side, before printing a pass from left to right.

Change the left spittoon foam when all the cleaning kit parts are replaced. The foams are provided with the printhead cleaning kit.

The left spittoon foam should be replaced four times as often as the printhead cleaning roll; replacement is automatically prompted by the printer.

CAUTION: If you fail to replace the spittoon foam when prompted, this may lead to cross-contamination between printheads, in which case all affected printheads may need to be replaced.

Waste bottle

The waste bottle contains a mixture of ink additives and water from the printhead cleaning roll system.

IMPORTANT: Dispose of this mixture according to local regulations. You can find the Safety Data Sheets (SDS) for the ink at http://www.hp.com/go/msds.

Distilled water tank

The distilled water tank has a capacity of 10 liters and should be filled with distilled water whenever the printhead cleaning roll is replaced, or when prompted by the printer.

IMPORTANT: You may not be able to print if the distilled water level is too low.

CAUTION: Fill the tank with distilled water only. Any other kind of water may cause printer malfunction.

Drop-detector spittoon foam

The printer can check the firing capacity of each single nozzle. Doing so causes ink to accumulate on the rectangular piece of foam located on the drop-detector area. This foam needs to be changed every time the cleaning roll is replaced. The foam is provided with the printhead cleaning kit.

How to work with ink system components

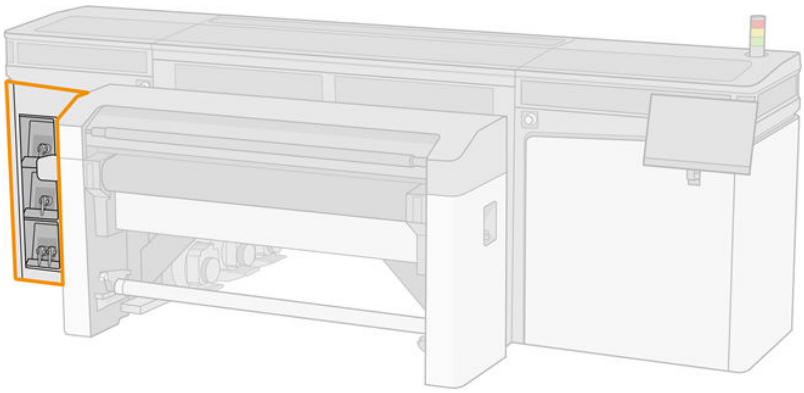
Ink cartridges

Remove an ink cartridge

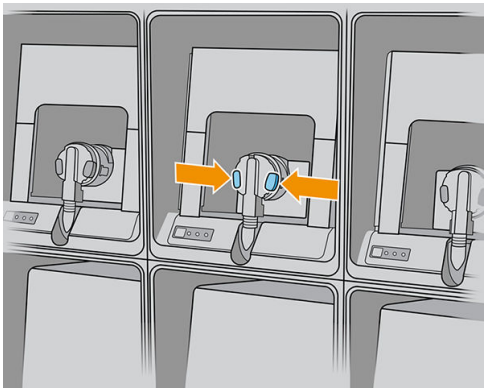
An ink cartridge should be removed and replaced when it is empty or past its expiry date. An empty cartridge is indicated in the Internal Print Server and by a red light beside the cartridge itself. You may also decide to remove a cartridge if it contains little ink and you want to provide for a long period of unattended printing.

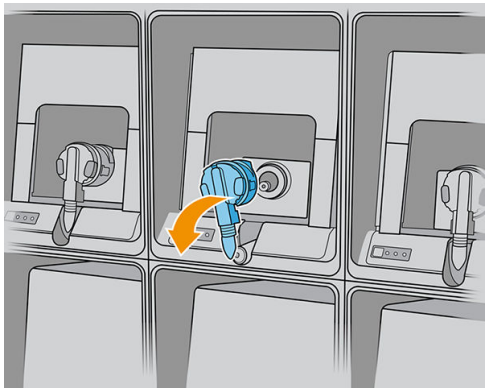
The printer can continue printing without any ink cartridges for at least 10 minutes, depending on the print mode and the job being printed. Therefore, cartridges can be replaced while printing continues. A functional ink cartridge is required in order to start a new job.

1. Go to the cartridge that you intend to remove. The cartridges are located at the front left of the printer.



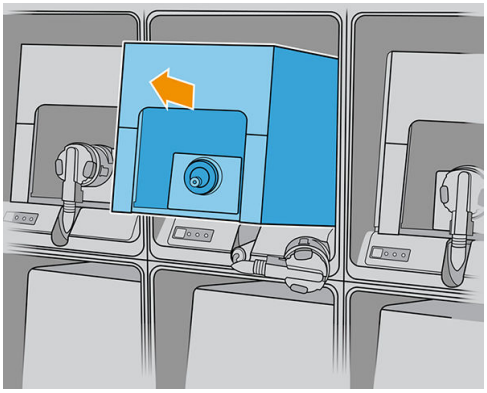
2. Disconnect the cartridge connector by pressing the tabs on each side of it and pulling it gently away from the cartridge.





3. Remove the empty cartridge from the printer.

NOTE: Some residual ink can be expected in the cartridge, ranging from 2% to 5% of the original content.

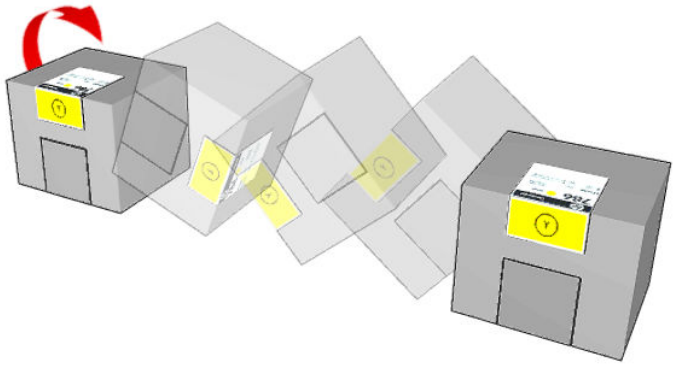


Insert an ink cartridge

NOTE: The ink cartridge is supplied in an insulating bag; do not open it until you are ready to use the cartridge.

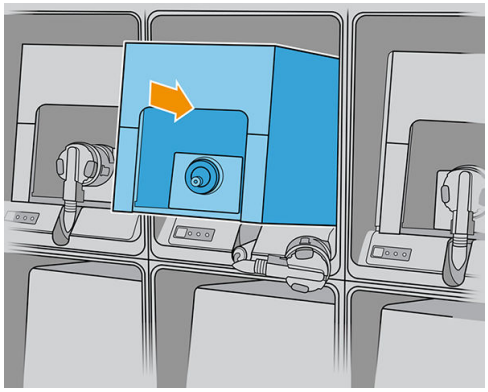
1. Check that the new cartridge is of the correct color.

2. Place the cartridge on a flat surface and turn it four times (rotating it through 360 degrees) as indicated on the label, to ensure that the ink is well mixed before use.

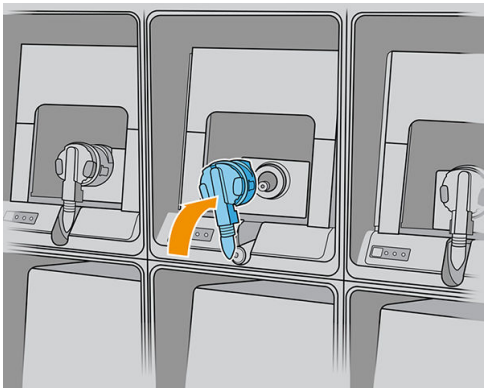


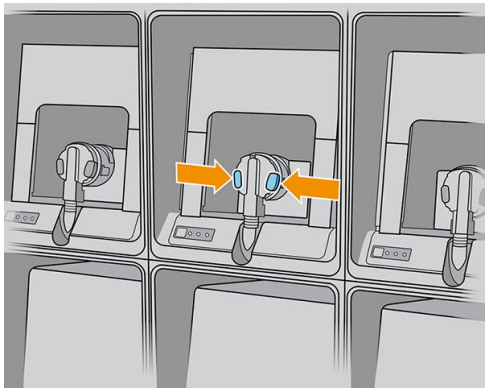
3. Tear off the square and fold it inside the handle as illustrated.
4. Put the new cartridge into its correct place on the printer.

TIP: Use both hands: the cartridge is quite heavy.



5. Check that the rubber part around the needle in the cartridge connector is clean. Clean gently if necessary.
6. Connect the cartridge connector to the cartridge.





NOTE: The cartridge connectors will refuse connection to the wrong type or color of cartridge. If you cannot connect the connector easily to the cartridge, check that you have the correct cartridge.

7. Ensure that the tabs on each side of the cartridge connector are opened but in place, showing successful connection. You will hear a click.

8. A few seconds after you have connected the cartridge, the white LED should be lit. If it is not lit after 10 seconds, reconnect the cartridge. The LED will turn red if the cartridge is expired or not valid; see the Internal Print Server for further details and corrective action.

NOTE: Dynamic security enabled printer. Only intended to be used with cartridges using an HP original chip. Cartridges using a non-HP chip may not work, and those that work today may not work in the future. More at: http://www.hp.com/go/learnaboutsupplies.

Although it is possible to use non-HP ink cartridges, this choice has several serious disadvantages. It may not be possible to determine with enough accuracy the ink level or status of used, refilled, or counterfeit ink cartridges. Any service or repair required as a result is not covered under the warranty. System ink flushing, color calibration, and printhead alignment are recommended. If you experience print-quality problems, HP recommends changing to Original HP inks.

Maintain the ink cartridges

During the normal lifetime of a cartridge, no specific maintenance is required. However, in order to maintain the best print quality, replace a cartridge when it reaches its expiration date. An alert notifies you when any cartridge reaches its expiration date.

You can also check a cartridge's expiration date at any time: see Printer status and alerts on page 23.

Check the status of the ink cartridges

The Internal Print Server provides information about the status of the ink cartridges. Additional information can be obtained from the status lights in front of each ink cartridge (on the left side).

- White steady light: Cartridge connected and checked
- White blinking light: Cartridge connected and checked, undergoing intermediate-tank refill process (ink pump on)
- Orange steady light: Cartridge connected and checked, low on ink
- Orange blinking light: Cartridge connected and checked, very low on ink
- Red steady light: Cartridge not connected, faulty, or empty

The level of ink remaining in each color is displayed at the top right of the Internal Print Server's home screen. You can see more details of ink cartridge or printhead status by tapping the ink or printhead widget, respectively.

NOTE: The ink level estimates are not guaranteed to be accurate.

NOTE: If the warranty status is **See warranty note**, this indicates that expired ink is being used. If the warranty status is **Out of warranty**, this indicates that non-HP ink is being used. See the limited warranty document provided with your printer for details of the warranty implications.

Printheads

Remove a printhead

WARNING! This operation is limited to trained personnel only!

NOTE: During the installation of the printer, the designated personnel received training for safe operation and maintenance of the printer. It is not allowed to use the printer without this training.

Risk of burns

Crush hazard

Risk of trapped fingers

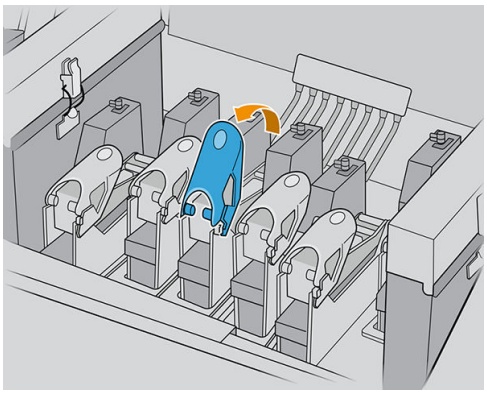
Hazardous moving part

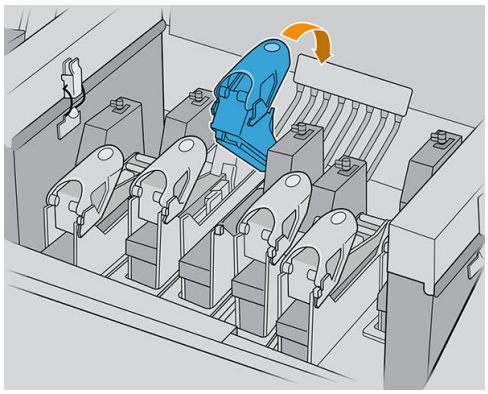
Electric shock hazard

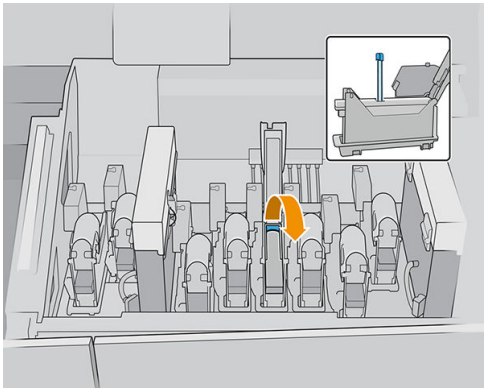
For more safety information, see Safety precautions on page 3

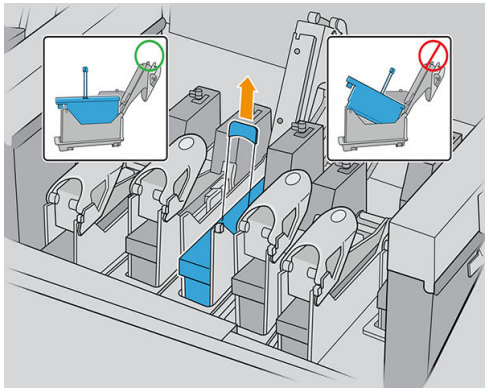
If a printhead develops an electrical fault or overheats, the Internal Print Server will indicate that it should be reseated or replaced. In addition, you may wish to replace a printhead if its warranty has expired or if you feel that its performance is not adequate.

1. Ensure that the printer is not trying to print: stop the job queue.
2. In the Internal Print Server, tap the printhead widget, then **Replace**.
3. Open the carriage cover to access the printheads.
4. The Internal Print Server tells you which printhead to remove. Release the latch that secures the printhead, and lift it.



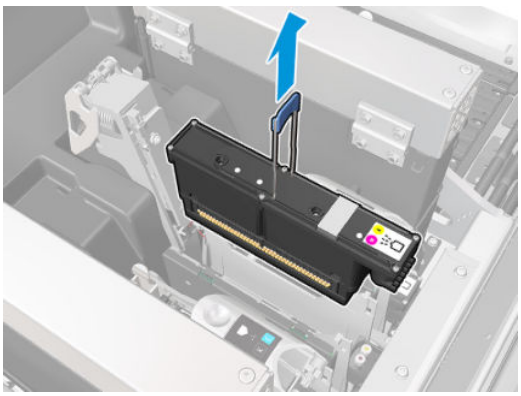






5. Lift the blue handle provided with the printhead, and pull the handle gently upwards to disconnect and extract the printhead from the carriage.

⚠ CAUTION: Remove the printhead slowly, as vertically as possible, without hitting any parts of the carriage or the sides of the slot. It may be damaged if you remove it too fast, or if you hit something.



6. Remove the printhead from the printer. The original packaging materials can be used to discard the old printhead or in case there is a need to return it to HP.

   If the printhead is to be reused, protect it using its orange sealing cap.

⚠ CAUTION: Make sure each printhead uses its own cap and not the cap for some other printhead. This is especially important with the optimizer printhead caps as there is a high risk of nozzle damage if they are mixed with the color printheads and vice versa. The optimizer caps are labeled as shown below.

NOTE: Remember which printhead came from which slot; the printer will report an error if you later replace a printhead in a different slot.

Insert a printhead

There are three kinds of printheads, but not all of them are compatible with all the slots to be found in the carriage.

IMPORTANT: Once you have placed a printhead in a slot, it cannot be moved to another slot.

When all the printheads have been installed:

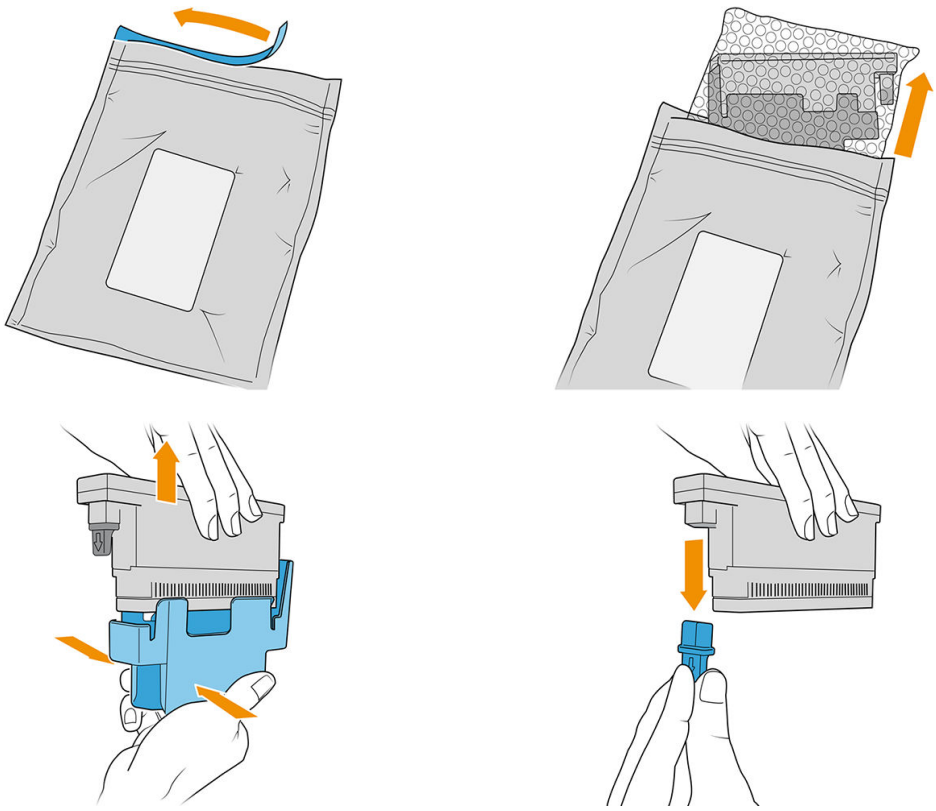
- Printheads in slots 1 and 2 will just be cleaned.
- Printheads in slots 3 to 8 will be purged with ink, which takes about 9 minutes for printheads in slots 3 to 6, and 14 minutes for printheads in slots 7 and 8. The printer displays a message when purging is complete.

1. Check that the new printhead is compatible with the slot in which you intend to install it.

   NOTE: Each printhead has a unique shape and cannot be inserted into the wrong slot. Do not try to force it.

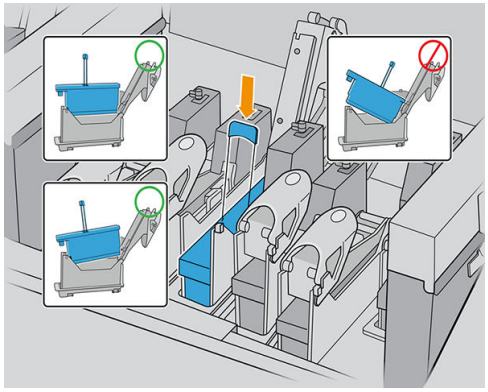
2. Remove its packaging and protective caps.

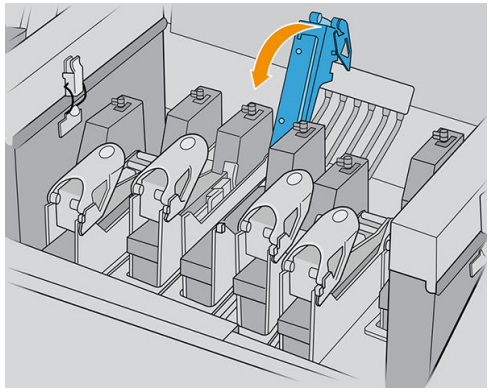
   TIP: You may wish to keep the protective caps for later reuse, in case you ever want to remove a printhead from the printer.

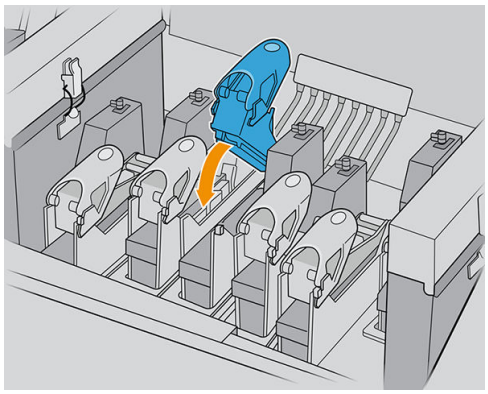


3. Put the new printhead into its correct place in the printer, and lower its handle.

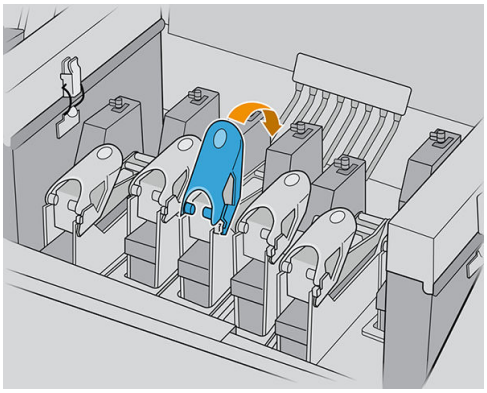
   CAUTION: Insert the printhead slowly. It is recommended to insert it as vertically as possible without hitting any parts of the carriage or the sides of the slot. It may be damaged if you insert it too fast, or if you hit something.



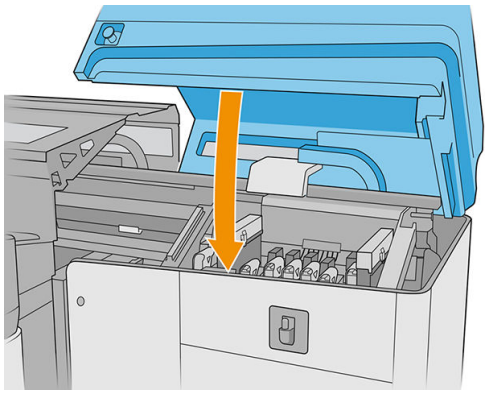




4. Lower the latch until it lies on the printhead, and secure the latch by opening it to fit the hook. Then close it.



5. Close the carriage cover and tap **OK**.



The printer checks that the new printhead has been correctly inserted (the status is shown in the Internal Print Server), and recommends printhead alignment, which is optional.

6. Restart the job queue.

Maintain the printheads

You should perform an automatic printhead check and clean every morning, before starting to print. While the printer is idle, the components of the ink can precipitate inside the printhead and block the nozzles. The check and clean process pre-cleans the printheads, checks them with the drop detector, and cleans them further if necessary. It takes between 10 and 30 minutes, depending on the condition of the printheads.

To maintain the best print quality, replace a printhead when it reaches its expiration date. An alert notifies you when any printhead reaches its expiration date.

You can also check a printhead's expiration date at any time: see Printer status and alerts on page 23.

Printheads should be aligned from time to time: see Align the printheads on page 115.

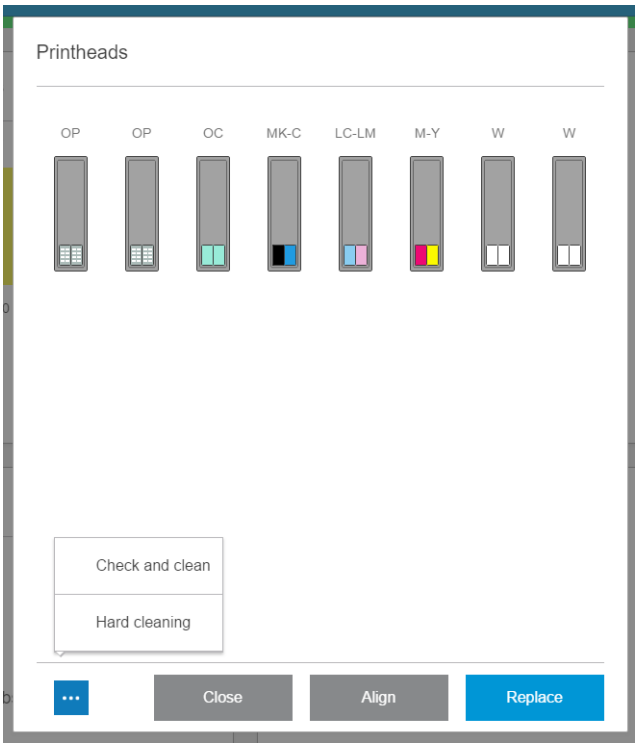
TIP: If you remove an unexpired printhead from the printer, planning to reuse it later, the best way to protect it is by replacing the protective caps that you removed before inserting it into the printer.

CAUTION: It is important to use the HP Latex Optimizer sealing cap for the HP Latex Optimizer printhead. Avoid any contact between the optimizer and the colored inks.

Check and clean the printheads

This procedure should be followed daily.

1. Go to the Internal Print Server and tap the printhead widget, then **Check and clean**.



2. Tap the **Check** button to perform routine cleaning automatically.

The check-and-clean process checks the printheads, recovers the ones with blocked nozzles, and replaces the nozzles that are not recovered with healthy ones for printing. If the missing nozzles have not been recovered, tap **Hard clean**.

Safe mode

Under certain conditions, including printer operation outside of environmental specifications, and when a used, refilled, or counterfeit ink cartridge has been detected, the printer will operate in 'safe' mode. HP is unable to warrant the performance of the printing system when operated outside of environmental specifications or when a used, refilled, or counterfeit ink cartridge is installed. Safe mode is designed to protect the printer and the printheads from damage due to unexpected conditions, and is in operation when the icon is displayed on the printer's computer. For optimal performance, use Original HP ink cartridges. HP Latex printing systems, including Original HP inks and printheads, are designed and engineered together to provide uncompromising print quality, consistency, performance, durability, and value—with every print.

NOTE: This printer is not designed to use continuous ink systems. To resume printing, remove the continuous ink system and install genuine HP (or compatible) cartridges.

NOTE: This printer is designed for ink cartridges to be used until they are empty. Refilling cartridges prior to depletion might cause the printer to fail. If this happens, insert a new cartridge (either genuine HP or compatible) to continue printing.

Replace the components of the printhead cleaning roll kit

http://www.hp.com/go/latexRseries/replace_ph_cleaning_roll_pinch

⚠ WARNING! This operation is limited to trained personnel only!

NOTE: During the installation of the printer, the designated personnel received training for safe operation and maintenance of the printer. It is not allowed to use the printer without this training.

Risk of burns

Crush hazard

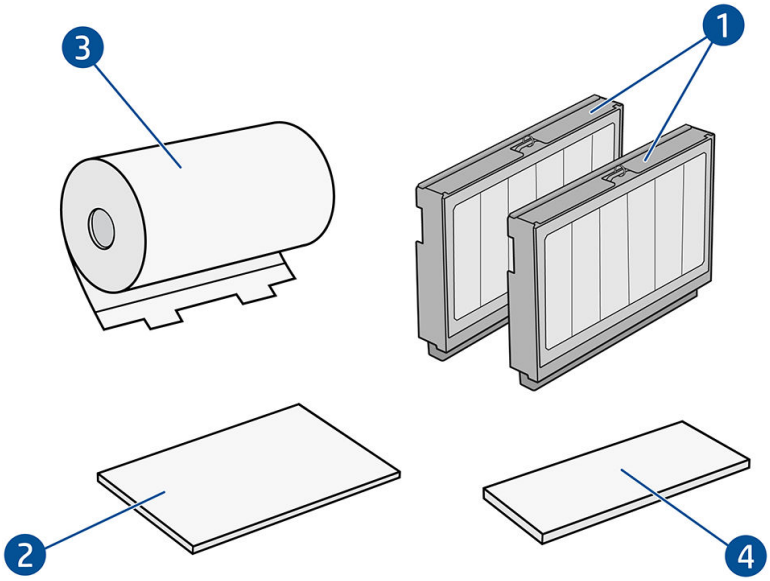
Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

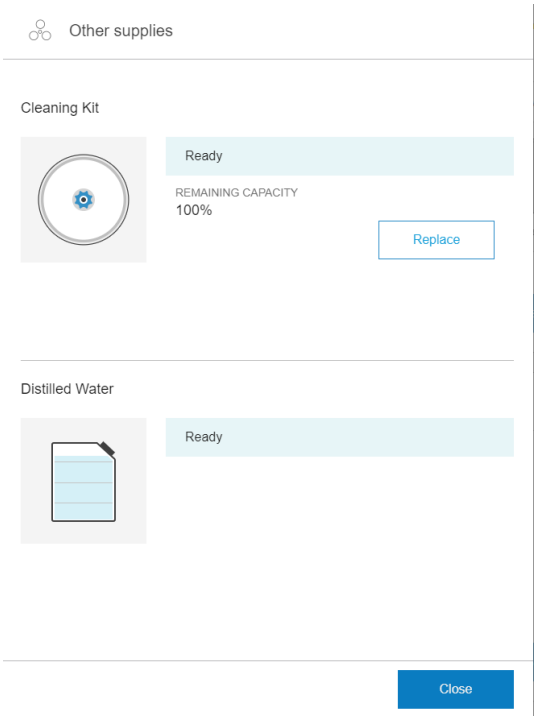
When the cleaning roll reaches its end, it must be replaced, together with the aerosol filters, left spittoon foam, drop-detector foam, and left printhead-cleaning rubber blade. All these parts are supplied together with the printhead cleaning kit. The water tank should be refilled at the same time.



1. Aerosol filters (2)
2. Left spittoon foams (4; use one at a time)
3. Printhead cleaning roll (1)
4. Drop-detector foam (1)
5. Printhead cleaning hard blade (transparent) (1)

Distilled water is also required, but is not provided in the kit.

The Internal Print Server provides instructions for all replacements, and HP recommends following the instructions. Go to the Internal Print Server, tap **Printer**, then tap **Other supplies** on the app bar, then tap the **Replace** buttton alongside the cleaning kit.



The wizard summarizes all the operations to be done:

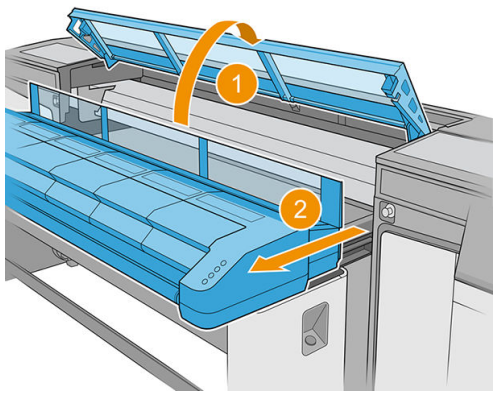
- Replace the left spittoon foam
- Replace the left printhead cleaning blade
- Refill the water tank
- Replace the aerosol filters
- Empty the printhead cleaning waste bottle
- Replace the drop-detector spittoon foam
- Replace the printhead cleaning roll

TIP: You are recommended to wear gloves.

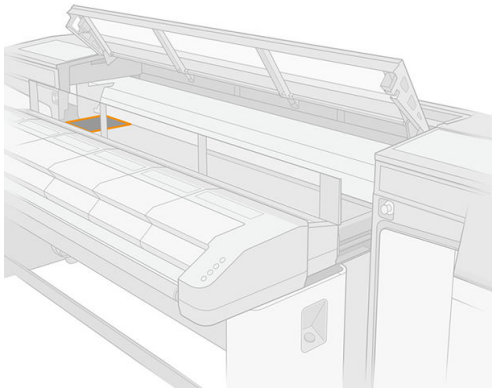
Tap **Next** at the bottom of the wizard window to start the first operation.

Replace the left spittoon foam

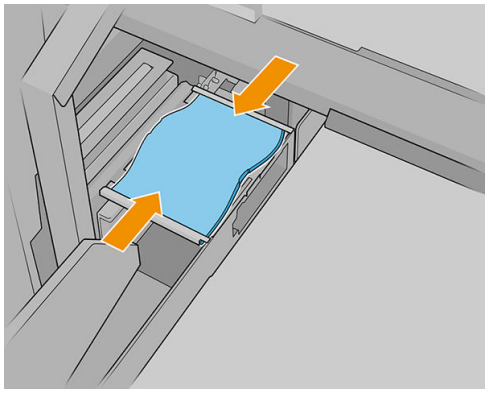
1. Open the top cover (1) and pull out the curing module (2).



2. Locate the left spittoon at the left side of the print area.



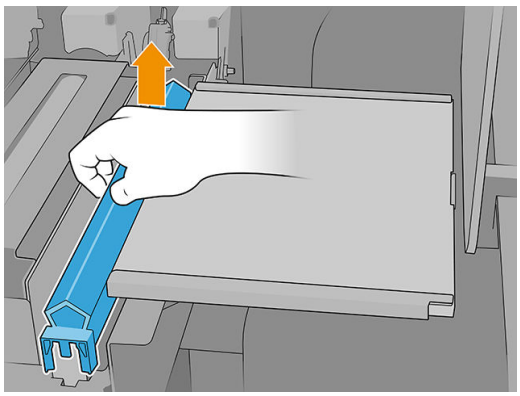
3. Remove the left spittoon foam, bending and raising it slighly.



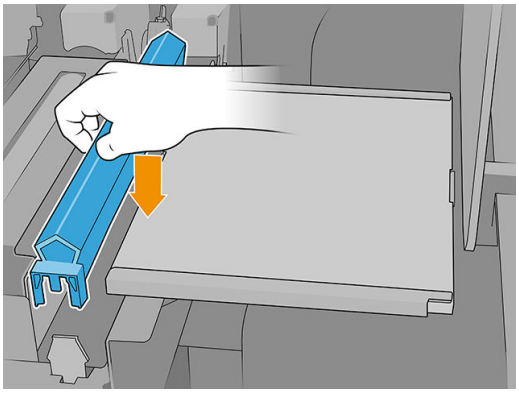
4. Insert the new foam into the left spittoon housing, bending it slightly. Ensure that it is flat after installation.

Replace the left printhead cleaning blade

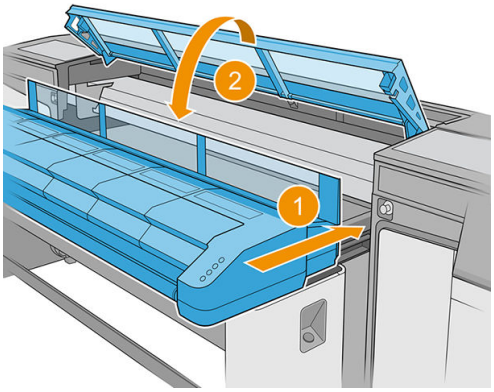
1. Grip the printhead cleaning blade in the center, and pull it out straight up.



2. Insert the new blade. Once the blade is mounted pushing from the center, gently push it down on the sides, so it seats on the lifters.



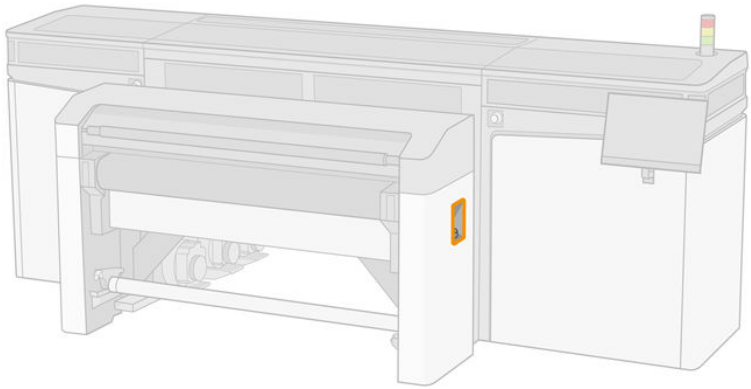
3. Close the curing module (1) and the top cover (2).



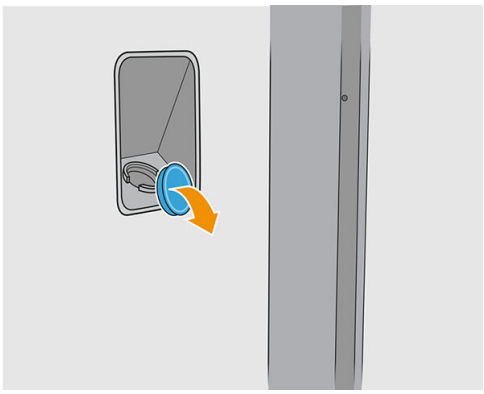
The printer now calibrates the blade height.

Refill the water tank

1. Locate the cap on the output path side cover.



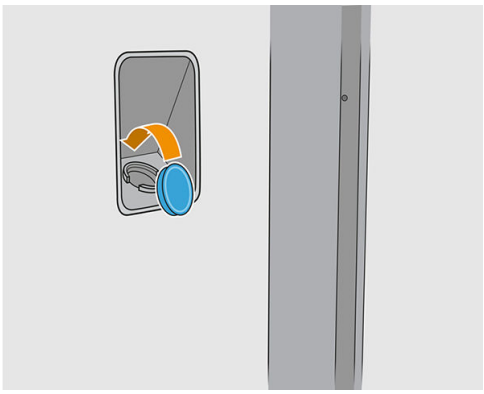
2. Open the cap.



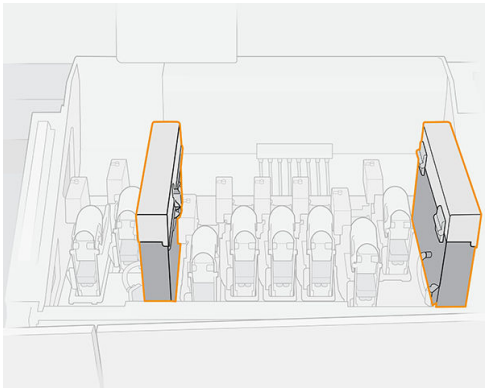
3. Refill the internal bottle with distilled water (not provided).

⚠ CAUTION: Be careful while filling the tank, as the level indicator distinguishes only between empty and not empty. Take care not to spill water outside the tank.

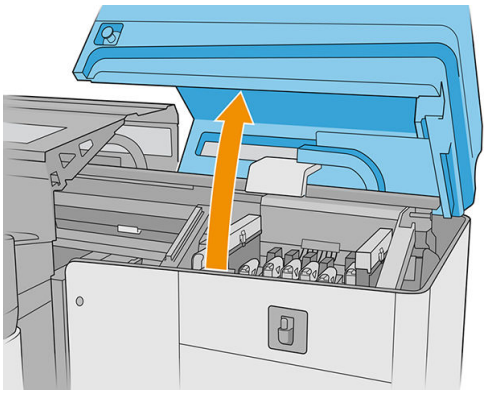
4. Close the cap.



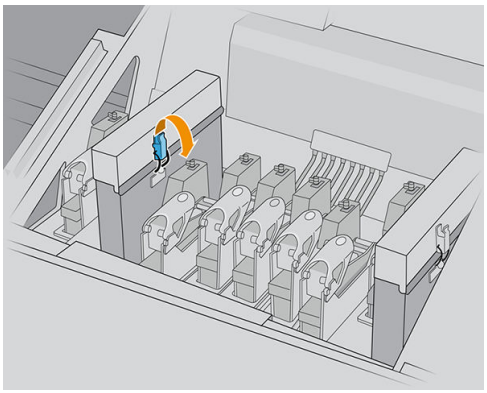
Replace the aerosol filters



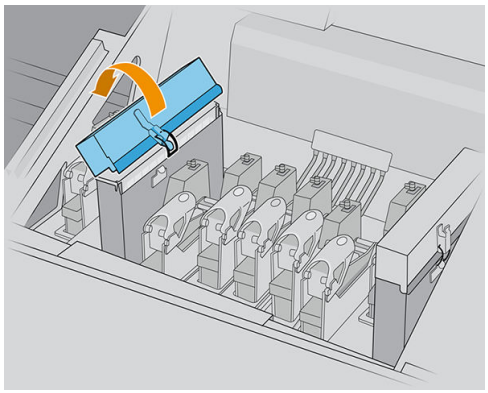
1. Ensure that all covers and doors are closed and remain in their original position.
2. Open the carriage cover.



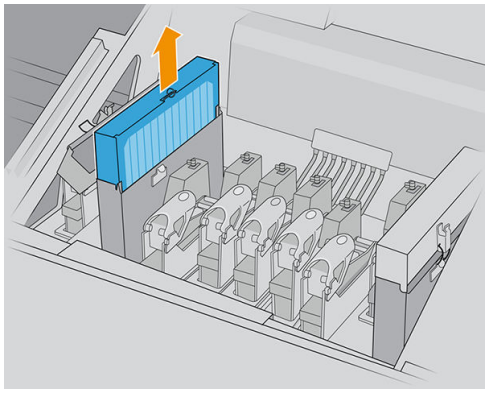
3. Open one latch on the right side of each aerosol filter module.



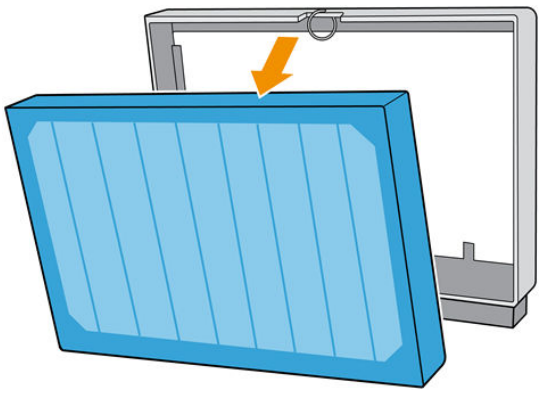
4. Open the lid of each filter.



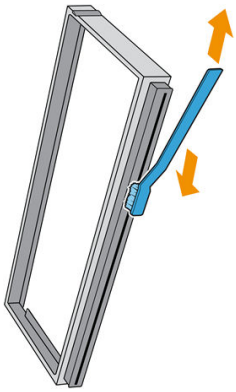
5. Extract the frame from the aerosol container.



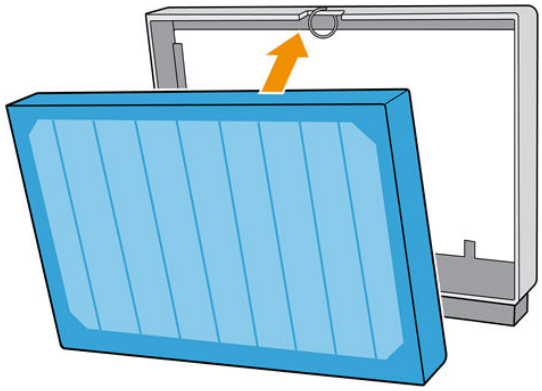
6. Remove the filter from the frame.



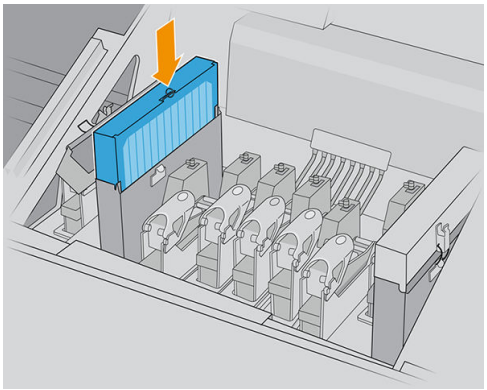
7. Clean the frame nozzle with the brush from the maintenance kit. Make sure to remove all accumulated fibers.



8. Insert the new filter into the frame.

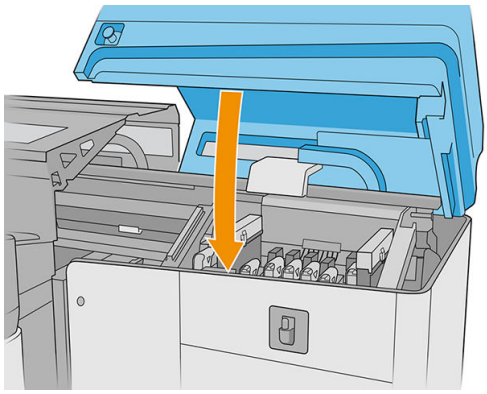


9. Insert the frame containing the new filter into the printer.
10. There is only one way to insert the frames that works. If you feel resistance, try to insert the frame the other way round.



11. Close the lid.
12. Close the latch.
13. Repeat the same process with the other aerosol filter.

14. Close the carriage cover.

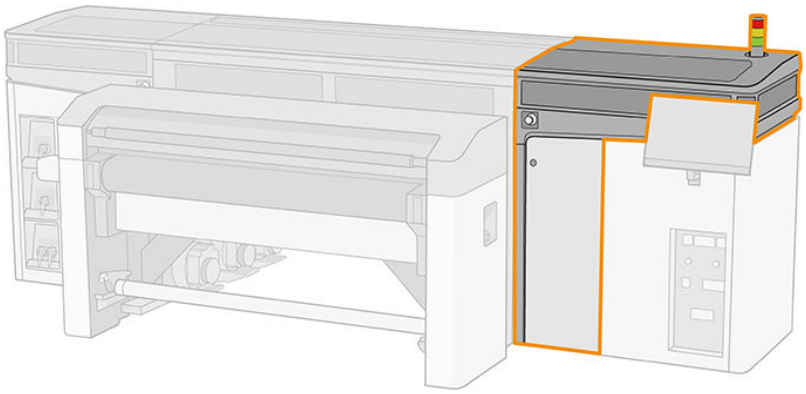


Empty the printhead cleaning waste bottle

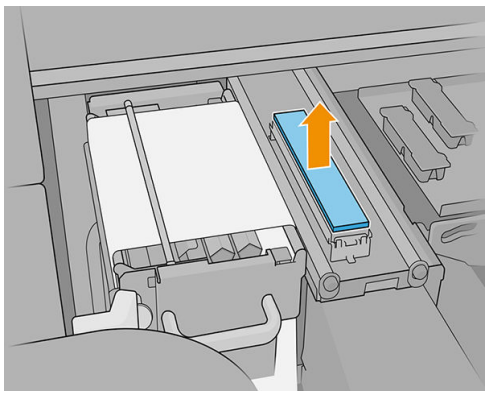
See Empty the printhead cleaning waste bottle on page 211.

Replace the drop-detector spittoon foam

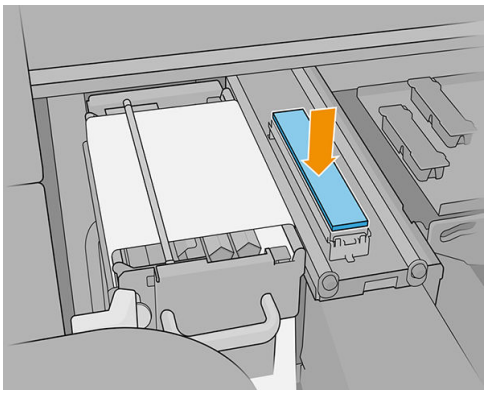
1. Unlock and open the printhead cleaning roll door on the front right of the printer, and open the carriage cover.



2. Locate the drop-detector spittoon foam.
3. Slide out the foam.



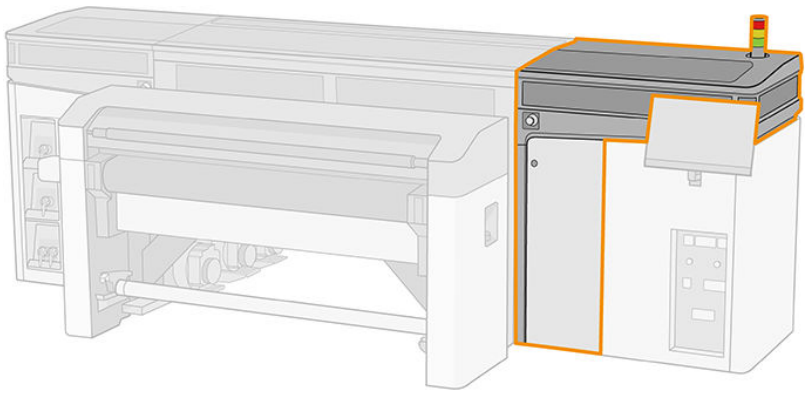
4. Insert the new foam into the housing. Ensure that it is flat.



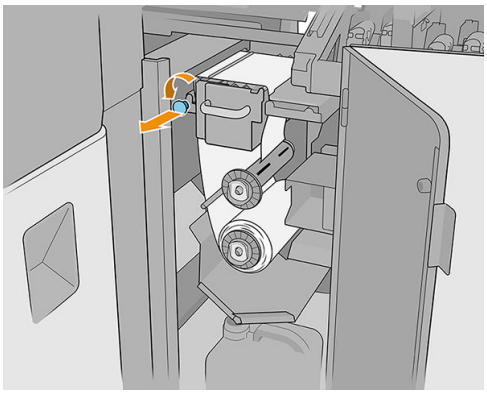
5. Close the carriage cover and the printhead cleaning roll door.

Replace the printhead cleaning roll

1. Any unused portion of the roll is wound on to the takeup roll at this time. You will be warned if the unused portion is more than 5% of the whole roll.
2. In order to replace the printhead cleaning roll, unlock and open the printhead cleaning roll door on the front right of the printer, and open the carriage cover.



3. Pull the black knob on the upper left and move the pinch mechanism aside.



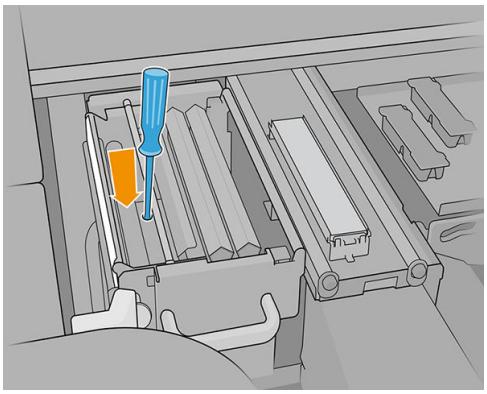
4. Remove the end of the roll and use it to remove all ink waste, dry ink, and fiber particles from the following components:
   - Orange printhead cleaning blade
   - Transparent printhead cleaning blade

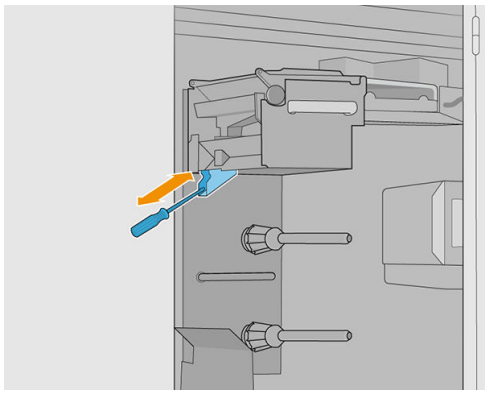
- Middle diverter (clean the whole surface)
- Sloping surfaces (use a putty knife if necessary)
- Left diverter
- Left latch
- Drilling hole
- Drive roller
- Pinch driver
- Pinch roller

IMPORTANT: Clean the pinch roller carefully with a sponge and distilled water. Errors may occur if it is not clean.

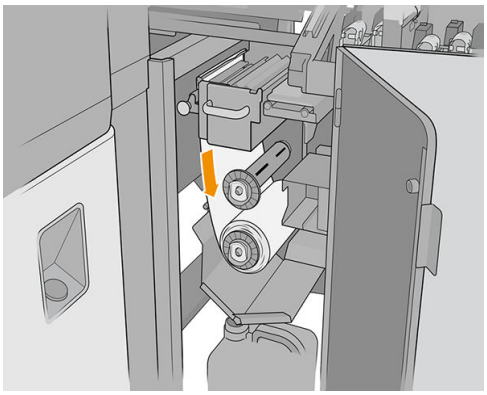
Also clean the tray under the pinch driver, using a sponge or putty knife.

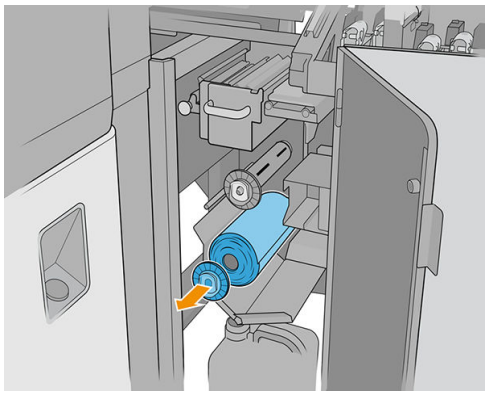
Make sure the drainage gap is unblocked, by removing any waste with a screwdriver.

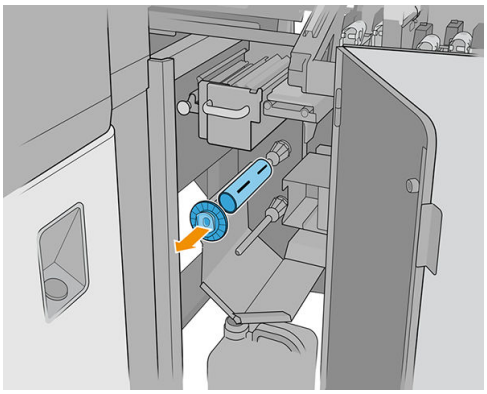




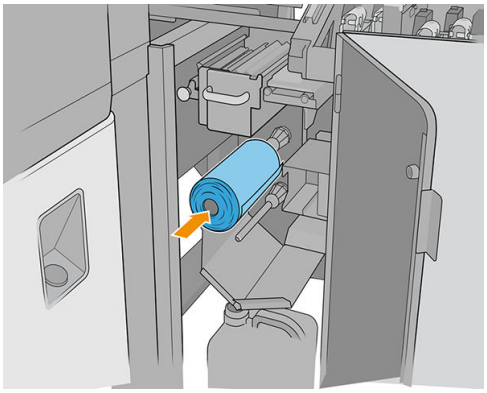
5. Clean the fluid dispenser nozzle with a brush to check that it is not clogged.
6. Slide both rolls off their axles and dispose of the roll with the used cleaning material according to the instructions provided with the new roll. Also consult your local authorities to determine the correct manner in which to dispose of wastes.



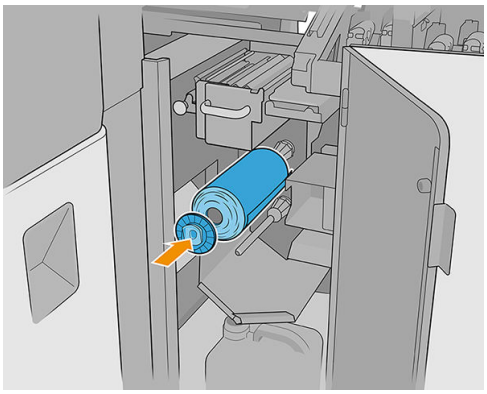




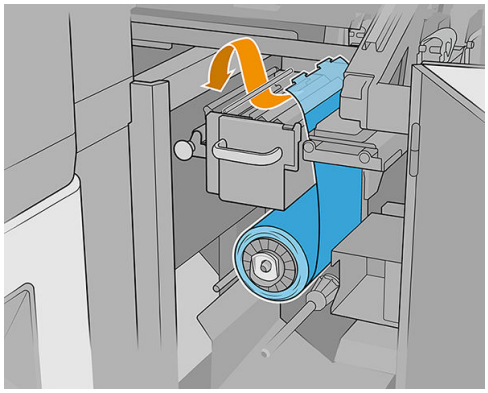
7. Keep the empty core to use as a takeup core.
8. Slide the new roll onto the upper axle, by pressing on the plastic core, not on the roll.



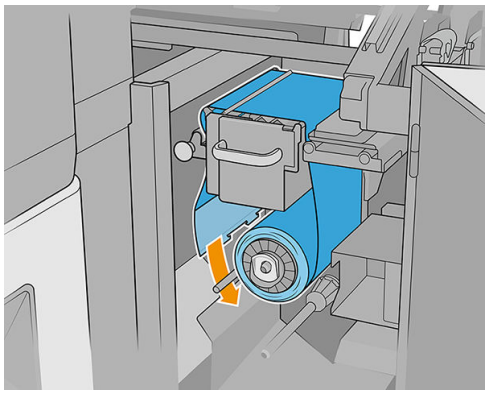
9. Insert the end cap on the upper axle, and slide it all together until you hear a click, in order to position the roll correctly.



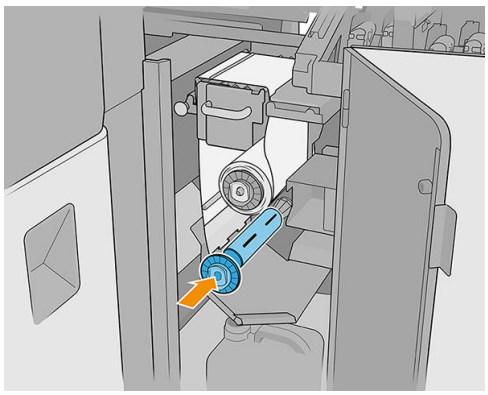
10. Pass the leading edge of the cleaning roll over the side diverters but below the central diverter, and thread the cleaning material through the pinchwheel on the left.

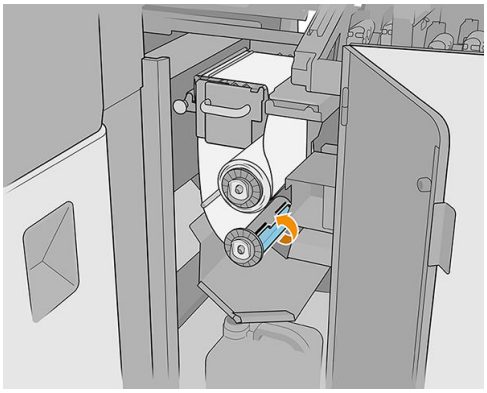


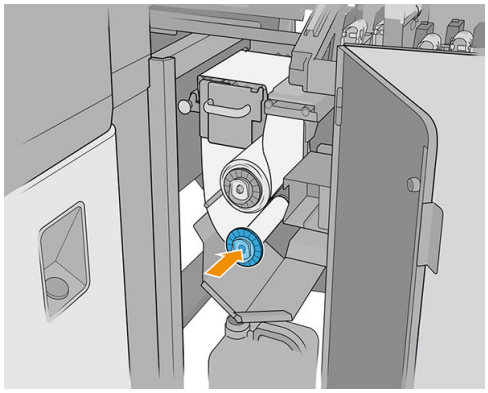
11. There is a strip of polyester film on the leading edge of the cleaning material. Insert it into the hole in the takeup core, which takes hold of it.



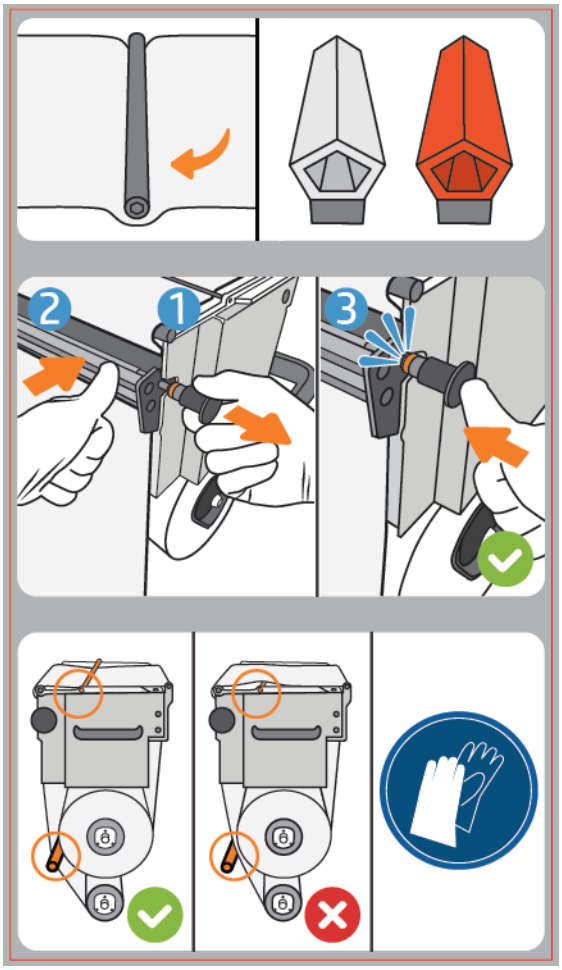
12. Slide the takeup core onto the lower axle.





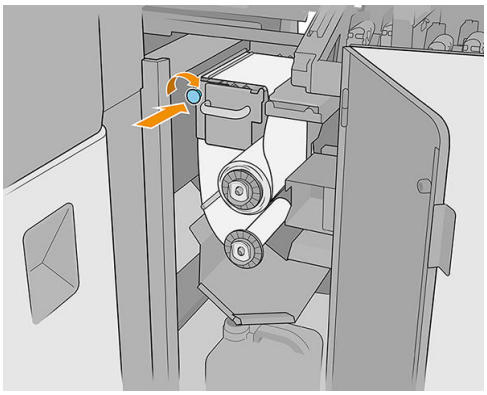


NOTE: If the cleaner roll has not been properly installed, you may see a message about clearing a printhead cleaning roll jam. Pull the whole assembly out, wind a little of the roll forward, then slide it back in again. The printer will check the roll again. You will need to tap **Reinitialize** to clear status errors.



13. Restore the pinch mechanism by moving the black knob back into place. If you feel resistance because the cleaning roll is too tight, turn the roll slightly counter-clockwise.

TIP: There is a blue ring on the far side of the black knob, which should not be visible if the knob has been correctly placed. If it is visible, try again.



14. Close and lock the door.
15. Tap **Finish**.

The printhead cleaning roll length tracking is now reset to 100%.

NOTE: If you tamper with half-used rolls, the usage shown in the Internal Print Server will not be accurate, and control of the roll may be impaired.

8 Printer calibration

- Align the printheads
- Possible difficulties with printhead alignment
- Color calibration
- Color consistency between different HP Latex R series printers
- Color emulation
- Color profiles
- Substrate-advance compensation
- Recommended calibrations after particular events

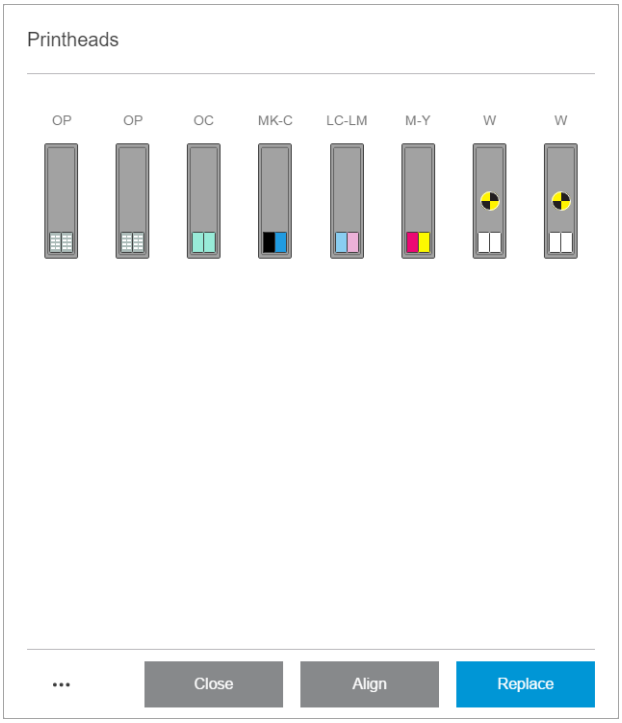
Align the printheads

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

Printhead alignment is recommended in these situations:

- After replacing or reseating a printhead.
- When a new substrate is loaded and the printhead-to-paper spacing changes significantly.
- When there are print-quality problems that could be caused by printhead misalignment.
- When alignment has not been done for 2 or 3 weeks.

To align the printheads, tap **Align** in the printheads widget of the Internal Print Server, then choose between automatic and manual alignment.



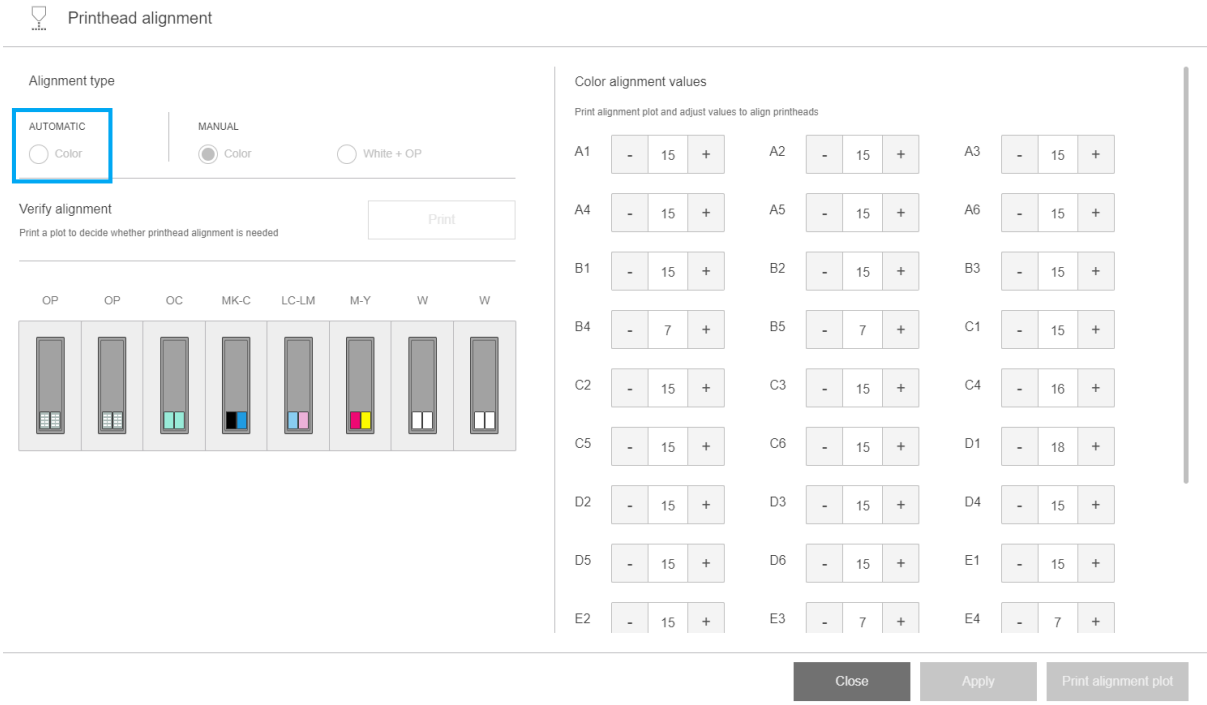
Printhead alignment can be affected by wrinkles or other substrate deformations in the print zone. Therefore, if the printer has recently been printing, you should wait for some minutes while it cools down. Just in case, the printer advances the substrate before aligning the printheads.

Automatic alignment procedure

Automatic alignment is a fully automated procedure that ensures optimal print quality in most cases.

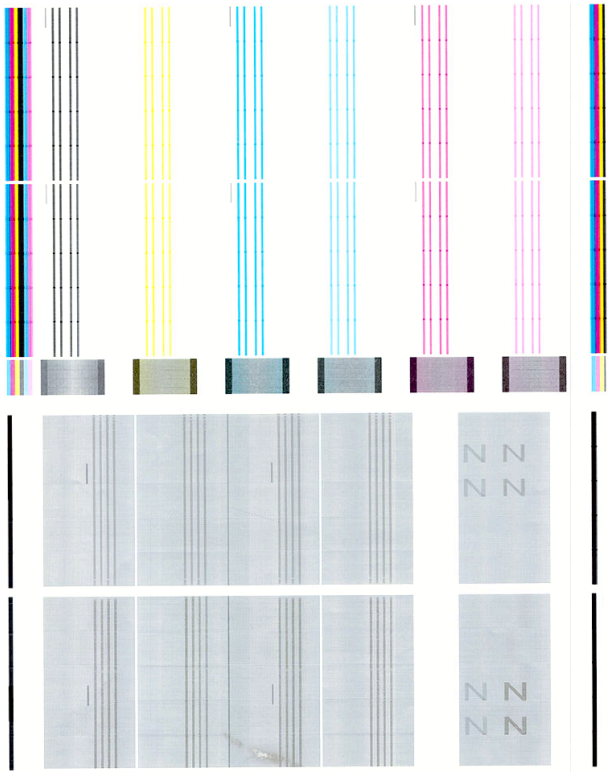
The printer prints three blocks of patterns and scans them with the built-in line sensor. This method is intended for any smooth, high-quality substrates (including vinyl and banner substrates).

Automatic alignment takes about 20 minutes. It is an unattended process, and uses printed substrate with dimensions 40 cm (15.7 in) wide by 50 cm (19.7 in) high. To launch, go to the Internal Print Server and tap **Printheads** > **Align** > **Automatic** > **Print alignment plot**.



The picture below shows the three printed patterns:

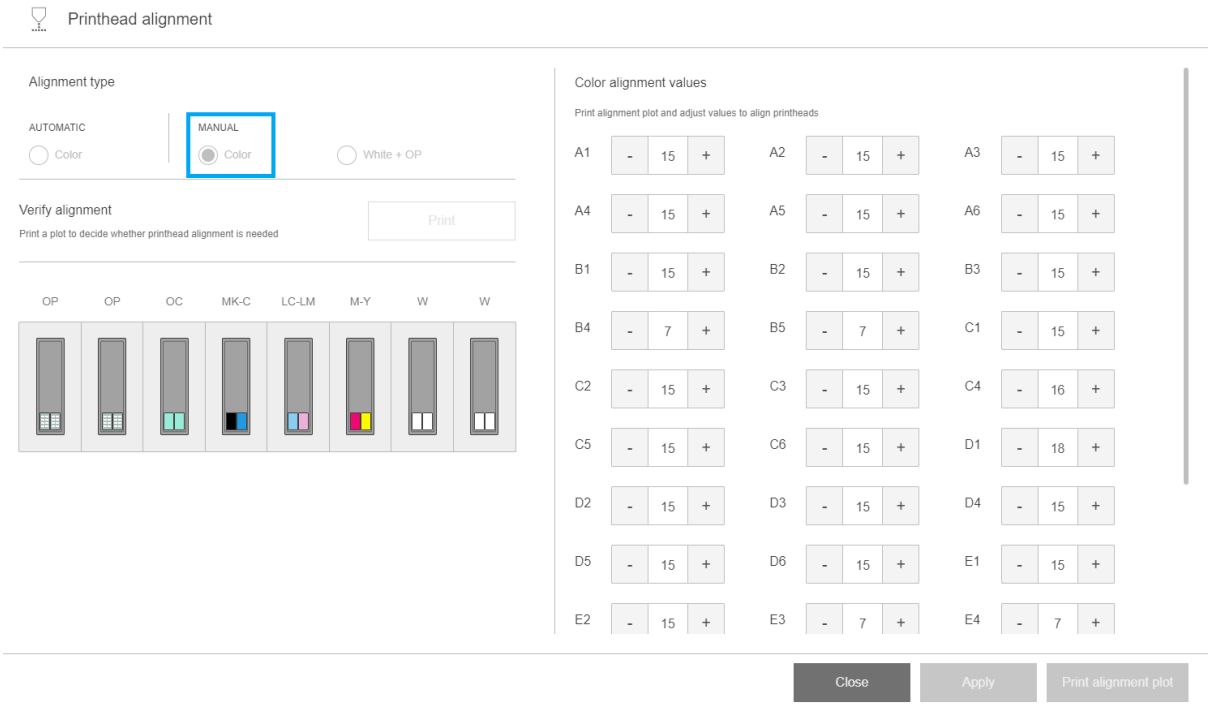
- Scan axis alignment of each colorant, speed of 55 ips
- Scan axis alignment of each colorant, speed of 45 ips
- Substrate axis alignment of each colorant



NOTE: If automatic alignment fails, see Automatic printhead alignment fails on page 266.

Manual alignment procedure

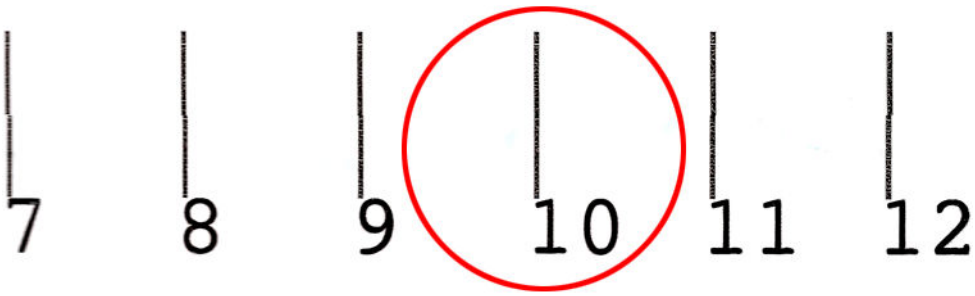
In the printhead alignment widget, tap **Colors** or **White + OP** under the MANUAL heading.



There are two manual alignment patterns: one for colors and one for white ink. White ink alignment can be done only if you have installed the white upgrade kit.

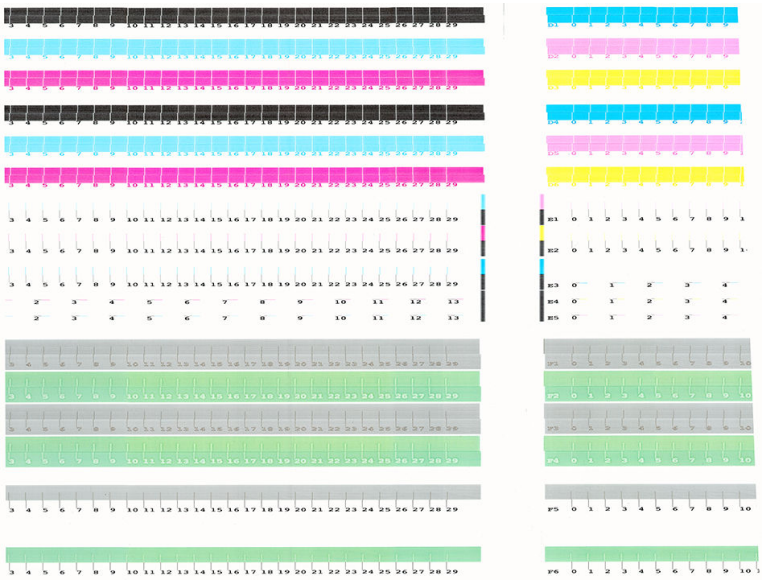
To launch manual alignment of colors, tap **Colors** under the MANUAL heading.

The printer prints X series of patterns, each one named with a letter (A–V). You must choose the best result from each of the series (for example, number 10 in the picture below).



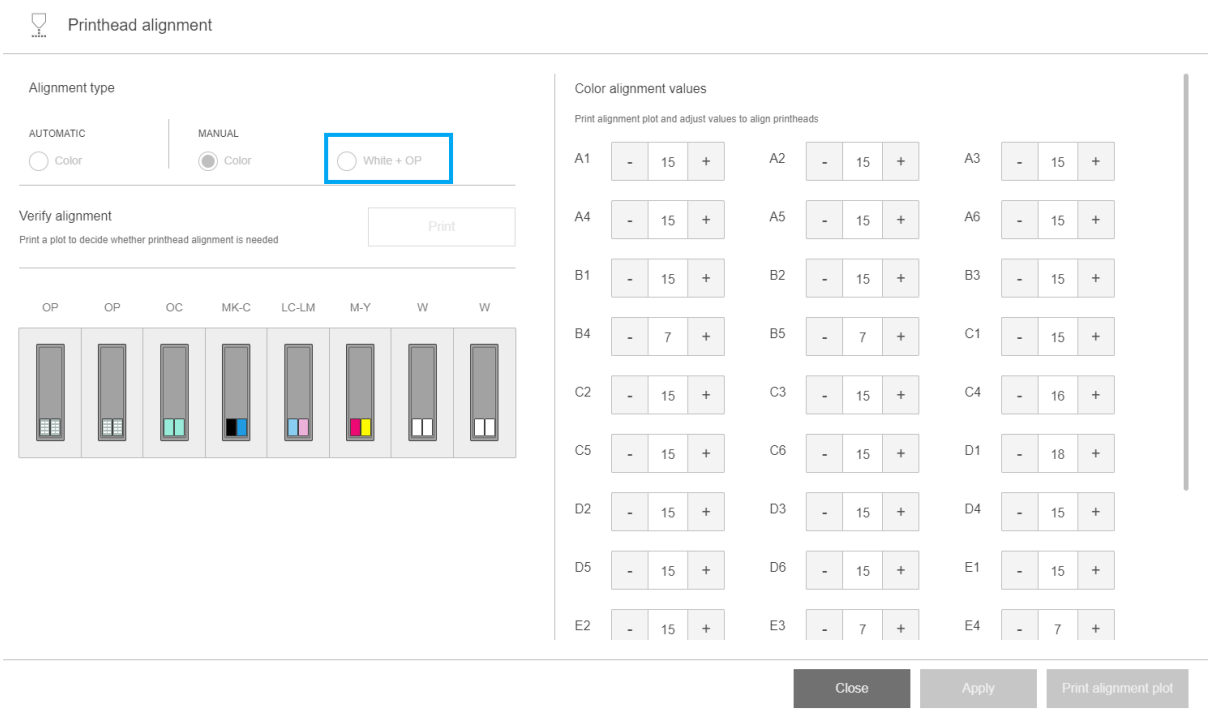
The alignment procedure includes both the colored printheads and the optimizer/overcoat printheads, and takes about 15 minutes. It consumes printed substrate of 72 cm width × 37 cm height (28.3 × 14.6 in).

NOTE: Depending on the firmware version, this pattern could be slightly different.

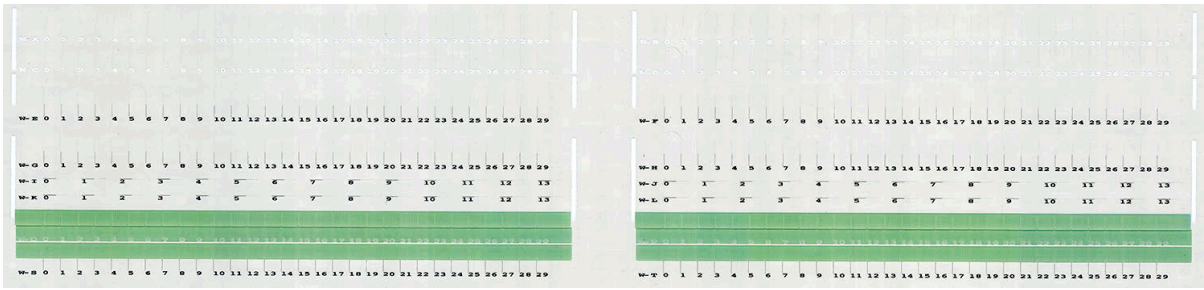


If you have installed the white upgrade kit, you should also perform the separate white printhead alignment, by returning to the printhead alignment widget and tapping **White + OP** under the MANUAL heading.

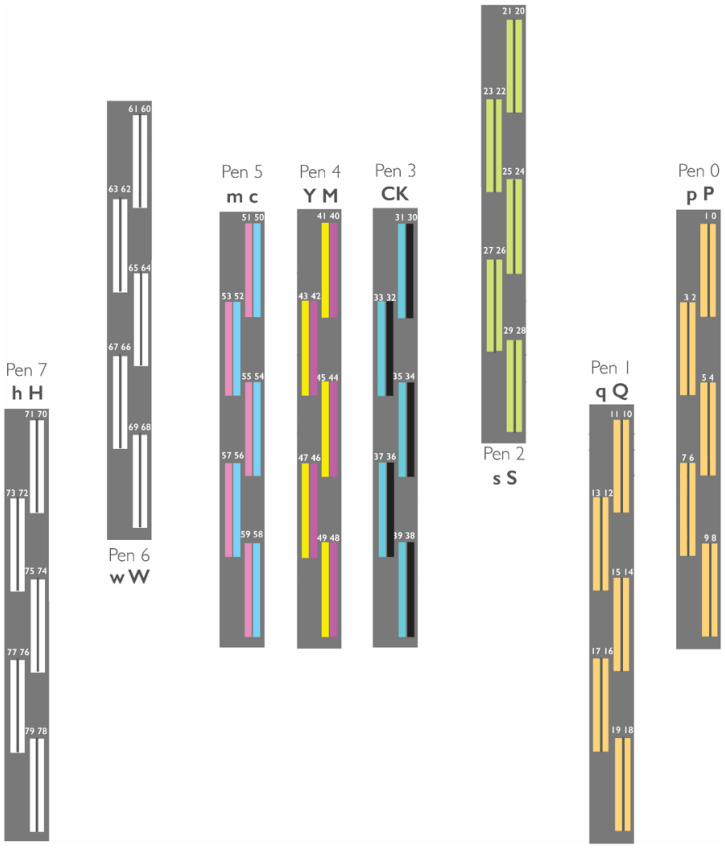
NOTE: **OP** stands for optimizer, in this case the optimizer for white ink.



Check the pattern below, following the same instructions as for the color manual alignment. See Manual alignment procedure on page 117.



The diagram below shows the distribution of printheads in the carriage. It also shows the correspondence between printhead and patterns, with guidance on the direction of the corrections (0–40) to be applied.



NOTE: In the above diagram, 'Pen' is used to mean 'Printhead'.

The following table summarizes the correction type controlled by each pattern:

Pattern	Affected printheads	Correction type
A1	K	Scan axis, bidirectional 55 ips
A2	LC	Scan axis, bidirectional 55 ips
A3	M	Scan axis, bidirectional 55 ips
A4	K	Scan axis, bidirectional 45 ips
A5	LC	Scan axis, bidirectional 45 ips
A6	M	Scan axis, bidirectional 45 ips
B1	K/LC	Scan axis
B2	K/M	Scan axis
B3	K/C	Scan axis
B4	K/M	Substrate axis
B5	K/LC	Substrate axis
C1	OC	Scan axis, bidirectional 55 ips
C2	Pt1	Scan axis, bidirectional 55 ips
C3	OC	Scan axis, bidirectional 45 ips
C4	Pt1	Scan axis, bidirectional 45 ips

Pattern	Affected printheads	Correction type
C5	K/OC	Scan axis
C6	K/Pt1	Scan axis
D1	C	Scan axis, bidirectional 55 ips
D2	LM	Scan axis, bidirectional 55 ips
D3	Y	Scan axis, bidirectional 55 ips
D4	C	Scan axis, bidirectional 45 ips
D5	LM	Scan axis, bidirectional 45 ips
D6	Y	Scan axis, bidirectional 45 ips
E1	K/LM	Scan axis
E2	K/Y	Scan axis
E3	K/C	Substrate axis
E4	K/Y	Substrate axis
E5	K/M	Substrate axis
F1	OC	Scan axis, bidirectional 55 ips
F2	Pt1	Scan axis, bidirectional 55 ips
F3	OC	Scan axis, bidirectional 45 ips
F4	Pt1	Scan axis, bidirectional 45 ips
F5	K/OC	Scan axis
F6	K/Pt1	Scan axis
WA	W	Scan axis, bidirectional 45 ips
WB	w	Scan axis, bidirectional 45 ips
WC	H	Scan axis, bidirectional 45 ips
WD	h	Scan axis, bidirectional 45 ips
WE	W/K	Scan axis
WF	w/K	Scan axis
WG	H/K	Scan axis
WH	h/K	Scan axis
WI	W/K	Substrate axis
WJ	w/K	Substrate axis
WK	H/K	Substrate axis
WL	h/K	Substrate axis
WO	Pt2	Scan axis, bidirectional 45 ips
WP	Pt2	Scan axis, bidirectional 45 ips
WS	Pt2/K	Scan axis
WT	Pt2/K	Scan axis

NOTE: W patterns appear on the white ink alignment print.

Aligning the optimizer printhead

The optimizer and overcoat inks are transparent, so they are not easy to detect visually. To make it easier, a background of composite ink has been added on top. It highlights the optimizer and overcoat, making them visible most of the time.

The patterns C2, C4, C6, F2, F4, and F6 are intended to align the optimizer printhead to the colored printheads, and the patterns C1, C3, C5, F1, F3, and F5 are intended to align the overcoat printhead to the colored printheads.

The image below shows the background with the optimizer lines on top of it.

Possible difficulties with printhead alignment

The optimizer or overcoat ink is invisible or hardly visible

The composite background to highlight the optimizer and overcoat inks works for most substrates, but occasionally, with some substrates, there is not enough contrast for it to work effectively. In these cases there are two possible solutions:

- Load a different substrate with more contrast to perform the alignment.
- Insert an intermediate correction (15), assuming the optimizer is well aligned. In this case, take a close look afterwards for associated defects, such as bleed, halo, or wicking (see Bleed, halo, wicking on page 253).

Another possibility is that the optimizer, overcoat, or colored printheads may have too many clogged nozzles, resulting in a poor background area fill, which makes it difficult to detect the optimizer bars. In this case, see Check and clean the printheads on page 97.

A pattern shows more than one good correction

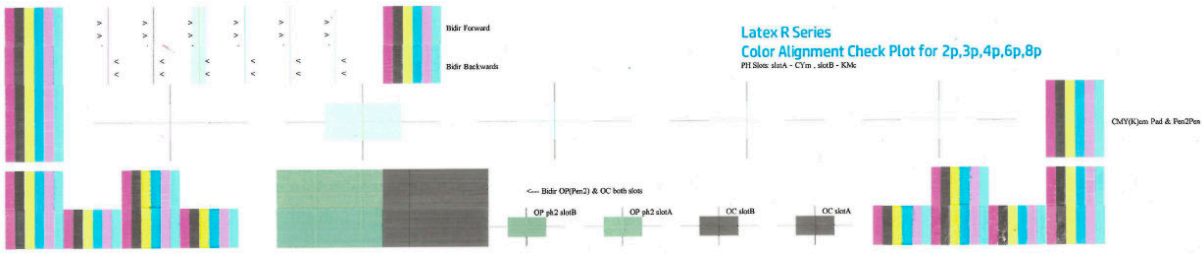
Occasionally you may find that a pattern has two or more possible good corrections, separated by two or more steps. This could be due to wrinkles on the substrate that change the printhead-to-paper spacing along the scan axis. To avoid this, ensure that the substrate is cold before starting the alignment, and advance it at least 70 cm to ensure that it is not deformed by the curing of the previous job.

Printhead alignment diagnostics plot

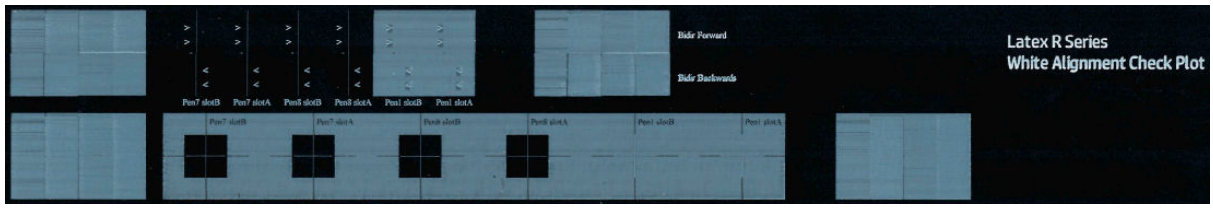
The printer offers a printhead alignment diagnostics plot, to assess the quality of the current printhead alignment. To print it, in the Internal Print Server tap **Printheads** > **Align** > **Print verification plot**.

IMPORTANT: HP strongly recommends printing both diagnostic plots (for color and for white ink) at the same time, on a transparent vinyl. If this is not feasible, the color diagnostic plot should be printed on white vinyl and the white diagnostic plot on black vinyl.

Color diagnostic plot



White diagnostic plot

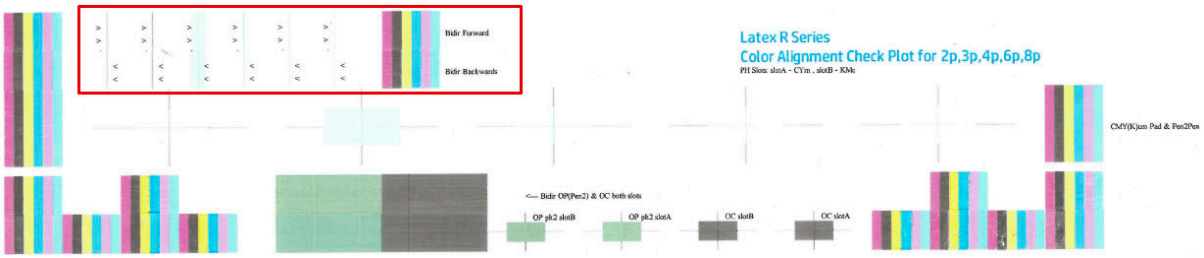


For yellow ink a background has been added to ease the visualization.

Zone 1: Bidirectional alignment for color printheads

This area shows bidirectional alignment for color printheads. The pattern is formed by series of vertical lines. Each printhead has a vertical line. Check that each color printhead is aligned with the line at the center. This line indicates where the expected translations are between forward and reverse directions.

The correct bidirectional alignment has been found when the forward and reverse lines are perfectly aligned.



Zone 2: Printhead-to-printhead alignment for color printheads

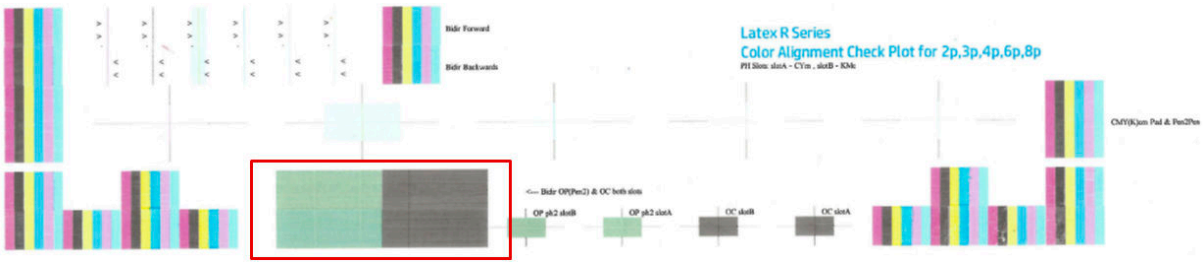
This area shows printhead-to-printhead alignment for color printheads.

Each inner color cross should be aligned with the outer black cross. Vertical lines show scan-axis alignment, horizontal lines show substrate-axis alignment.

Zone 3: Bidirectional alignment for optimizer and overcoat

This area shows Bidirectional alignment for optimizer and overcoat.

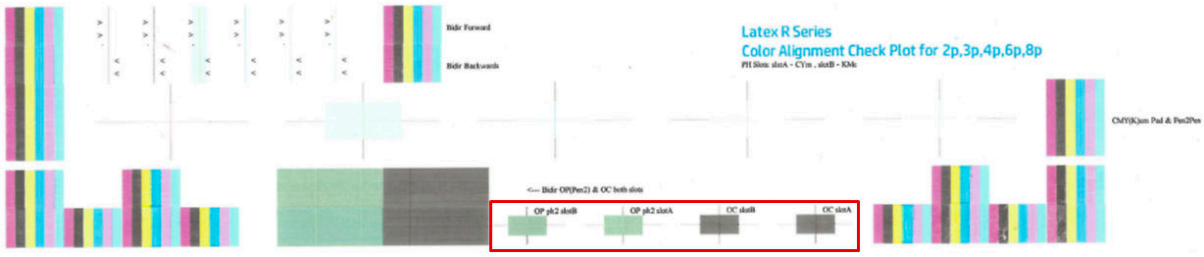
The pattern is formed by series of vertical lines. Each printhead has a vertical line. Check that each color printhead is aligned with the line at the center. This line indicates where the expected translations are between forward and reverse directions. The correct bidirectional alignment has been found when the forward and reverse lines are perfectly aligned.



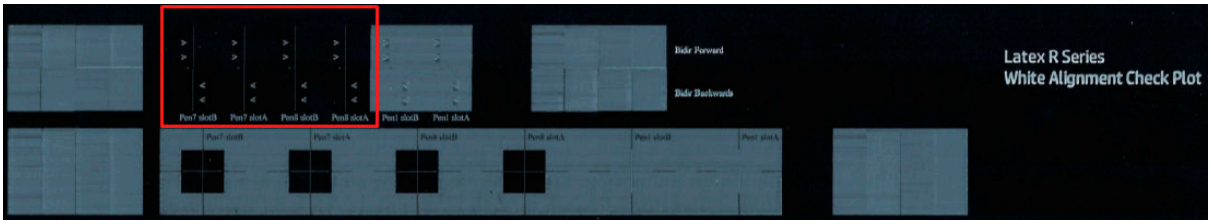
Zone 4: Printhead-to-printhead alignment for optimizer and overcoat

This area shows printhead-to-printhead alignment for optimizer and overcoat. As both fluids are transparent, there is a colored background that highlights their presence, green for optimizer and gray for overcoat.

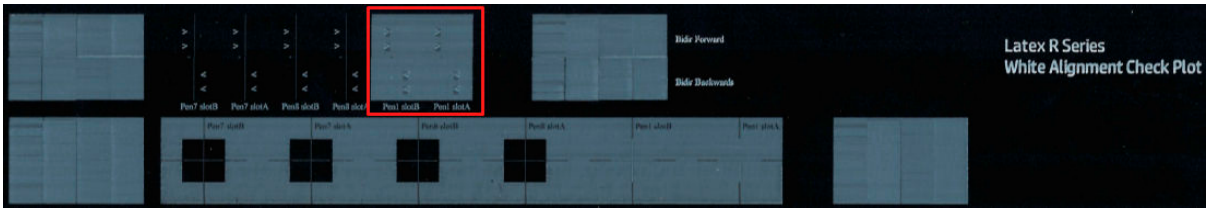
In each case, the inner cross should be aligned with the outer cross.



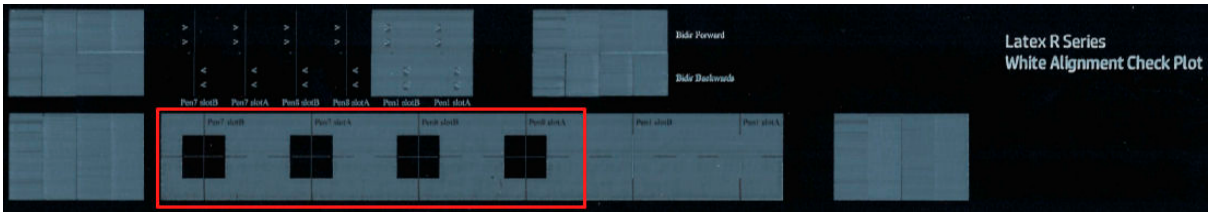
Zone 1: Bidirectional alignment for white printheads



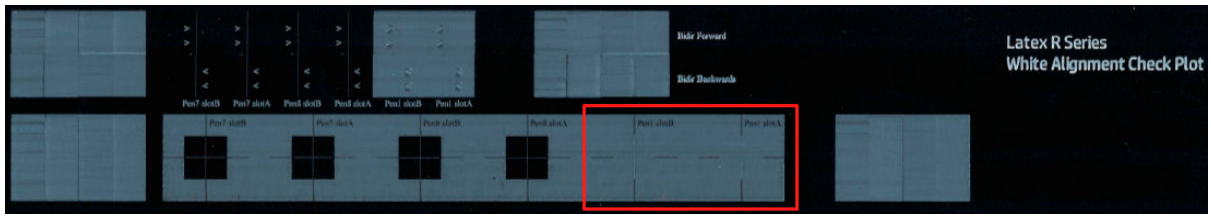
Zone 2: Printhead-to-printhead alignment for white printheads



Zone 3: Bidirectional alignment for optimizer and overcoat



Zone 4: Printhead-to-printhead alignment for optimizer and overcoat



Color calibration

Color calibration enables your printer to produce consistent colors with a particular substrate type, even if printheads, ink cartridges, and environmental conditions change.

Color calibration sets the ink restriction and linearization, which varies with the drop weight of the printhead. This calibration has been designed to provide consistency as the printhead ages (drop-weight degradation) and from one printer to another. For example, to reach a maximum cyan density of 0.6, one printhead may require 3 drops while another one may require 3.5 drops (lower drop weight).

For generic substrate profiles, there are no factory-reference color-calibration values in the printer or within the presets: the first calibration for each substrate sets the color reference for future calibrations. The future calibrations will therefore try to match the colors of the first calibration. In this way you maintain consistency as the printhead ages.

Good nozzle health is important, and the printheads should also be as new as possible for best performance when you make the first calibration.

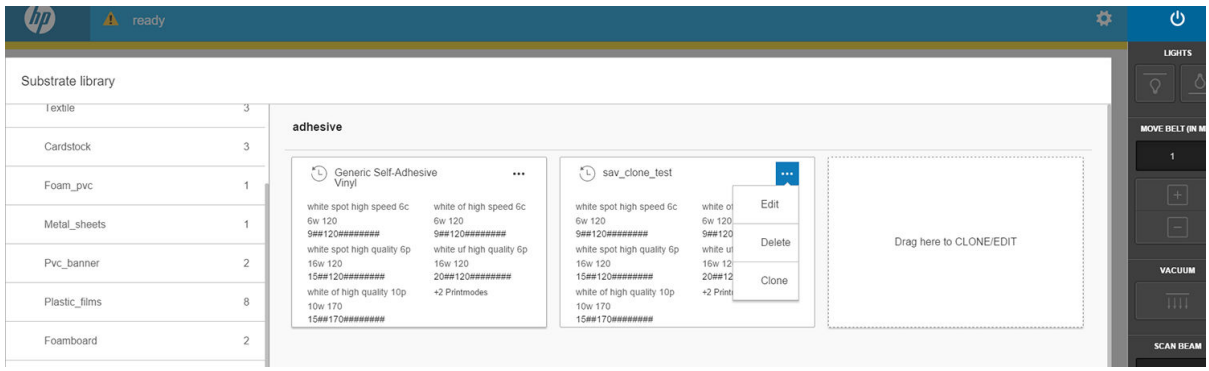
It is also important to have the printheads well aligned (see Align the printheads on page 115), and to make sure the substrate is advancing correctly (see Substrate-advance compensation on page 128), otherwise the color pattern may appear blurry or with slightly different colors.

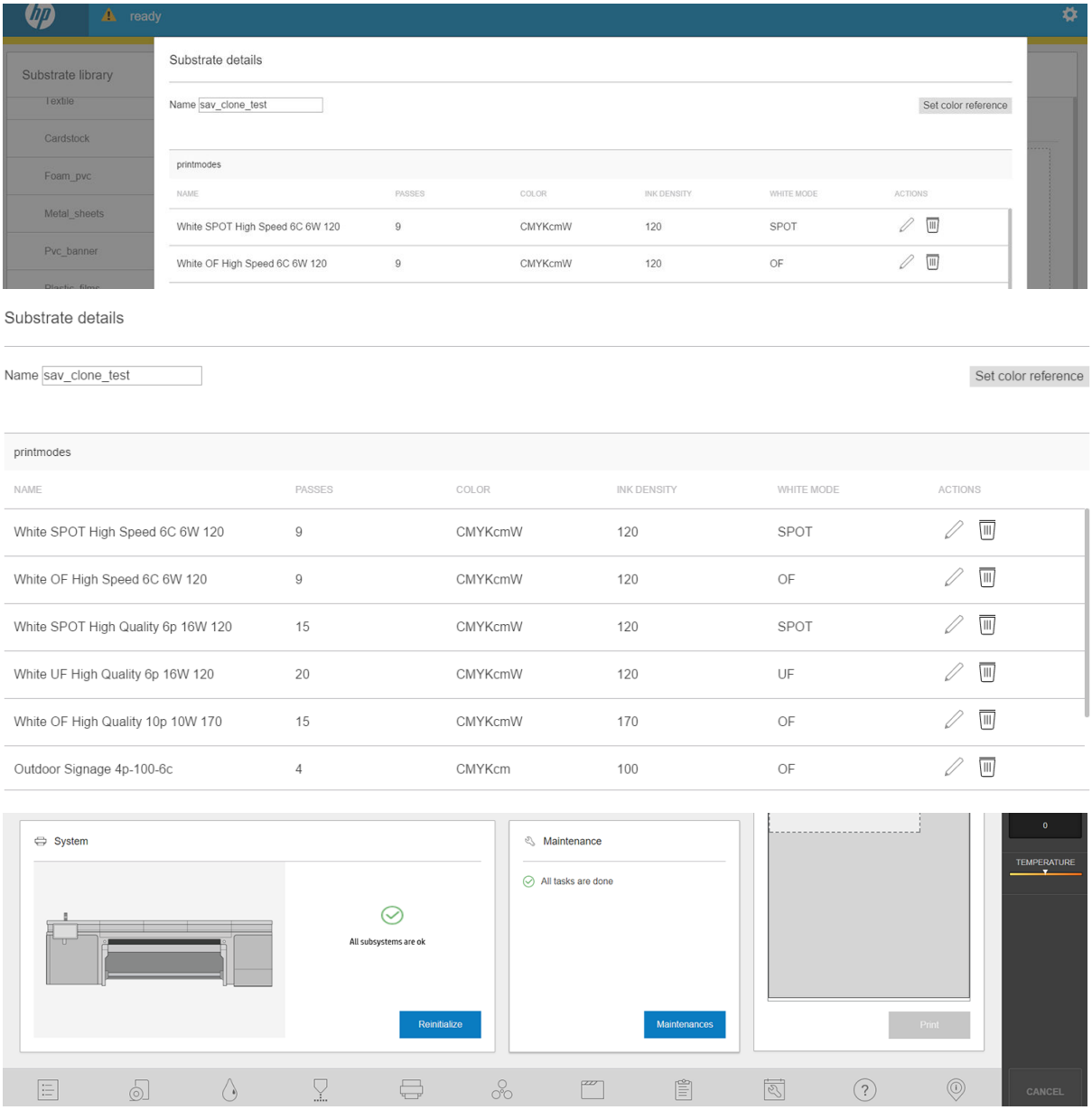
NOTE: Substrates can be color-calibrated only if they are cloned, white, opaque, non-porous, and wider than 61 cm (24 in).

For rigid substrates

1. To start color calibration from the Internal Print Server, tap **Substrate library** in the app bar, and select the substrate you want to calibrate from the list on the left. Once you can see your substrate in the center of the screen, tap ..., then **Edit** > **Print color reference**, and the color calibration starts.
2. When the test chart has been printed, tap **Load or scan color reference**, and load the printed chart into the printer.

TIP: It is best to reload the chart in the same position as it was when you printed it. To do so, you are recommended to enable the automeasure option in both cases.





For flexible substrates

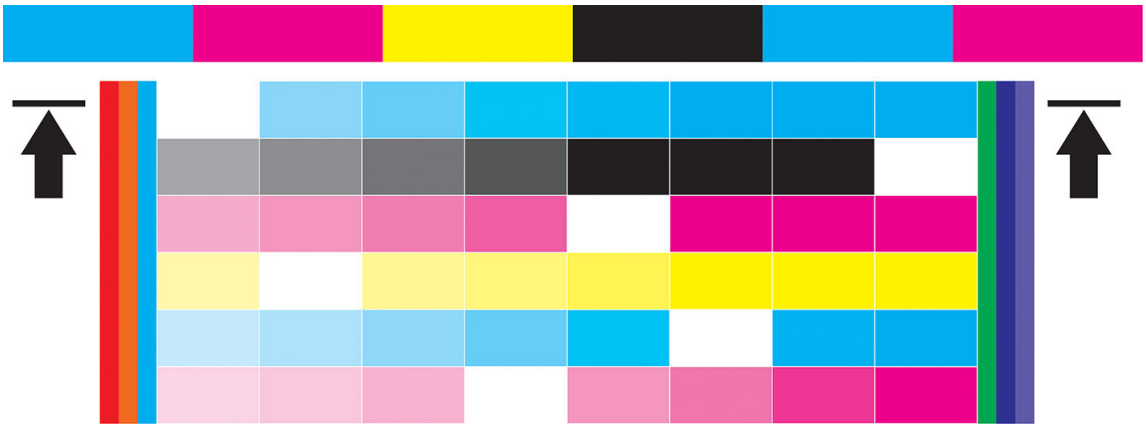
▲ To start color calibration from the Internal Print Server, tap **Substrate library** in the app bar, and select the substrate you want to calibrate from the list on the left. Once you can see your substrate in the center of the screen, tap ..., then **Edit** > **Print color reference**, and the color calibration starts.

IMPORTANT: To calibrate a flexible substrate, you must calibrate a roll on a spindle, not just a loose sheet of flexible substrate.

NOTE: Color calibration is not recommended when the carriage beam is in a higher position than normal.

The calibration process is fully automatic and can be performed unattended after you have loaded substrate of the type you wish to calibrate. The process takes about 15 minutes and consists of the following steps:

1. The color calibration test chart is printed, which contains patches of different densities of each ink used in your printer.



2. The test chart is scanned and color-measured using the embedded spectrophotometer. If the scan cannot be completed successfully, a message is displayed by the Internal Print Server; see Color calibration fails on page 270.

3. From the measurements made by the spectrophotometer, the printer calculates the necessary correction tables to apply to your print jobs for consistent color printing on that substrate type—except in the case of the first calibration, which sets the reference for later ones.

When to calibrate

Calibration should be done in any of the following circumstances:

- Whenever a new substrate type is introduced that has not yet been calibrated: to set the reference.
- Whenever you notice excessive color differences between prints. Such color differences can be caused by aging and wear of the printheads, installing new printheads, changes in substrate characteristics between one roll and another, changing environmental conditions, and so on.

Calibration status

- **Default** status indicates that this substrate has never been calibrated, and therefore no reference state is defined.
- **Done** status indicates that a color calibration has been performed successfully on this substrate, the reference state is defined and still up to date.
- **Obsolete** status indicates that the printer status has changed since the reference was defined, so a new calibration must be done in order to maintain color consistency.

Color calibration is based on the color measurement of printed color patches, using the embedded spectrophotometer. Some characteristics of substrates, such as surface roughness or transparency, may make reflective color measurement of some substrate types very inaccurate. Color calibration of these substrates may fail or produce unacceptable printing results.

TIP: If color calibration fails at the first attempt, it is worth trying again.

To delete the reference for a given substrate, so that you can create a new reference for that substrate, you must clone the substrate. The new substrate will have no color reference.

You should calibrate a substrate type before creating its color profile; however, you can later recalibrate without needing to recreate the color profile.

Color consistency between different HP Latex R series printers

It is possible to print consistent colors on different HP Latex printers by exporting a calibrated substrate preset (see Substrate presets on page 74) from one calibrated printer to another. This process ensures that both printers use the same color references.

1. Create the reference for the first printer: do at least the first color calibration with the substrate in question.
2. Export the substrate preset from the first printer. The reference is also exported.
3. Import the substrate preset to the second printer.
4. Perform color calibration with the same substrate for the second printer, to make it consistent with the reference imported with the preset.

Now both printers have the same reference for the same substrate, and all the consecutive color calibrations will be trying to match this reference state.

Color emulation

Between the same printer models and the same substrate

1. Go to the substrate library, tap **Import**, then select the **.oms** file from printer 1 to install it in printer 2.
2. Color-calibrate both printers.
3. Apply to the image the ICC color profile embedded in the **.oms** file, using the Colorimetric rendering intent in both printers.

   IMPORTANT: Set the Colorimetric rendering intent from the RIP.

4. Print with both printers, using the same mode.

Between different printer models, or the same models but different substrates

1. Download from the substrate library the correct **.oms** file for each printer, and install it in each printer.
2. Color-calibrate both printers.
3. Apply to the image the ICC color profile embedded in the **.oms** file, using the Colorimetric rendering intent in both printers.

   IMPORTANT: Set the Colorimetric rendering intent from the RIP.

4. Print with both printers, using the equivalent modes (ink densities, number of passes, and so on).

Color profiles

Color calibration provides consistent colors, but consistent colors are not necessarily accurate. For instance, if your printer prints all colors as black, its colors may be consistent but they are not accurate.

In order to print accurate colors, it is necessary to convert the color values in your files to the color values that will produce the correct colors from your printer, your inks, and your substrate. An ICC color profile is a description of a printer, ink, and substrate combination that contains all the information needed for these color conversions.

These color conversions are performed by your Raster Image Processor (RIP), not by the printer. For further information on the use of ICC profiles, see the documentation for your application software and for your RIP.

Substrate-advance compensation

Accurate substrate advance is important to print quality because it is part of controlling the proper placement of dots on the substrate. If the substrate does not advance the proper distance between printhead passes, light or dark bands appear on the print, and there may be an increase in graininess.

The printer has a belt-advance sensor to optimize the movement of the belt.

See Troubleshoot print-quality issues on page 243 for steps to determine whether belt-advance compensation will help you. In general, belt-advance calibration is recommended when you see print-quality problems.

The belt-advance sensor may not work correctly if it is dirty. See Clean the substrate-advance sensor on page 185.

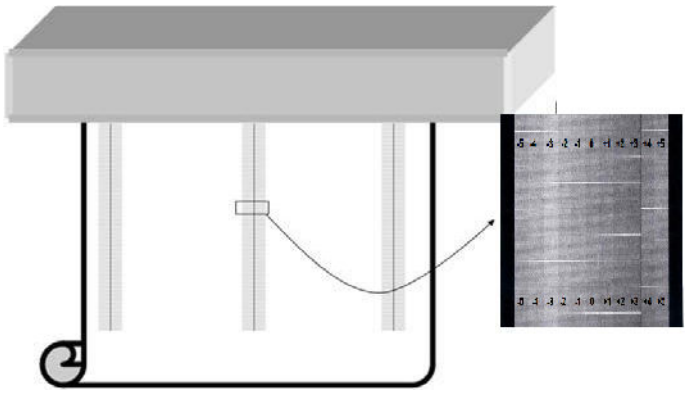
If the sensor was dirty, after cleaning it the advance compensation already calculated may not be valid, so you are recommended to set the advance compensation to zero and check that the advance is correct.

Substrate-advance test print

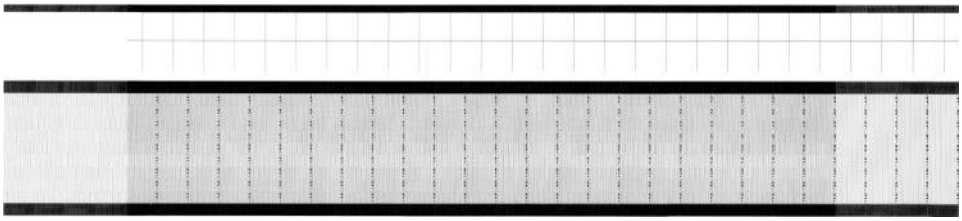
The substrate-advance test print can help you to adjust the advance more accurately. In the Internal Print Server, tap **Printer** > **Advance calibration**. The printer prints several repetitions of a special numbered pattern that help you to apply the correct substrate-advance adjustment. Locate the pattern in the center of the substrate.

IMPORTANT: Before printing this test, ensure that the black nozzles are healthy and the printheads are aligned.

TIP: To see the patterns most easily, use a vinyl substrate.



The calibration pattern consists of several numbered columns.



Locate the lightest of the columns and enter its number as the advance parameter for the **Printer** > **Printing adjustments dialog**. If there are two colors with same light hue, chose the average between them. Follow this process for as many as patterns are printed (23). Remember that IPS values are expressed as o/oo.

Afterwards, reprint the test and check that the lighter column in the pattern is centered at 0 on average.

Recommended calibrations after particular events

	Printhead replacement	New substrate created	New substrate imported	New substrate loaded	Print mode changed	Poor print quality
Printhead alignment	Recommended	Not needed unless new substrate has different thickness	Not needed	Not needed unless carriage beam has moved	Not needed	Recommended if relevant
Color calibration	Recommended	Recommended	Recommended	Not needed, unless never done before	Not needed	Recommended if relevant

9 Hardware maintenance

⚠ **WARNING!** Hardware maintenance may be performed by trained personnel only. During printer installation, the designated personnel received training for safe operation and maintenance of the printer. It is not allowed to use the printer without this training.

- Safety precautions
- Maintenance resources
- Summary of maintenance operations
- How to perform maintenance operations
- Printer-system movements
- How to turn the printer off and on for maintenance operations
- Daily recommended maintenance
- Daily recommended maintenance (white ink only)
- Weekly maintenance
- Monthly maintenance
- Every 4 months (white ink only)
- 375 liter maintenance
- 750 liter maintenance
- When required

Safety precautions

Read and follow the safety precautions section to make sure you use the equipment safely: see Safety precautions on page 3.

You are expected to have the appropriate technical training and experience necessary to be aware of hazards to which you may be exposed in performing a task, and to take appropriate measures to minimize the risks to yourself and to others.

Maintenance resources

Maintenance kits and tools

User maintenance operations and their timing are described in the following chart.

In order to perform all the maintenance operations during the first months, there are two options:

- Purchase the cleaning kit: This kit has the basic tools in order to perform the weekly and monthly maintenances during the first months.
- Purchase the Printer Maintenance Kit (PMK): This kit has all the tools needed to perform the maintenance operations required during the first 1500 liters of printing. This kit also includes the cleaning kit.

  If the PMK is not purchased with the printer, it will be required afterwards when prompted by the printer, after printing about 190 liters.

  The PMK may be used by you or by the service team, depending on your service contract.

The Service Maintenance Kit (SMK) is also requested by the printer and should be purchased. The service team or technical support will perform SMK operations.

Maintenance frequency	Cleaning kit	PMK	SMK 1	SMK 2	WMIK	SMK (white)	User up-time kit	Expert up-time kit
Weekly	X							
Monthly	X							
375 L		X						
750 L		X						
3 megacycles			X					
3000 L or 6 megacycles				X				
4 months (white)					X			
4 years (white)						X		
When required							X	X

NOTICE: These maintenance frequencies may be changed dynamically by the Internal Print Server, according to the printer usage.

When to buy

- Cleaning kit: When you have used its contents
- PMK: Never, included with the printer and in SMK1 and SMK2
- SMK1: When the printer requires it (3 megacycles)
- SMK2: When the printer requires it (6 megacycles)
- White Maintenance Inbox Kit (WMIK): Never, included in SMK (white)
- SMK (white): When required by the printer (4 years)
- User up-time kit: Optional
- Expert up-time kit: Optional

Kits and parts required for maintenance operations are shown below:

Name	Part number	Purpose	How to order
Cleaning kit	K0Q45-67270	User maintenance For weekly and monthly cleaning	Through the usual channel; also included in the printer maintenance kit
Printer maintenance kit	K0Q45-67271	User maintenance (if you have a service contract, the service team will perform the maintenance operations) Covers all required maintenance up to 1500 liters	Includes a new cleaning kit
Service maintenance kit	K0Q45-67272 (order/buy when required)	Service maintenance For 6M carriage cycle maintenance routine*	Through the usual channel

* Frequencies are approximate and will depend on print mode usage.

NOTE: For the latest information on kits available for your printer, and their contents, see http://hp.com.

Up-time user spare parts kits

Name	Part number	Purpose	How to order
Basic uptime kit	K0Q45-67267	Set of spare parts that can be replaced by customers and resolve the most common failures	Provided with your printer in most locations worldwide. If necessary, you can purchase the kit through the usual channel.
Expert user kit (optional)	K0Q45-67269	Set of spare parts that due to their technical complexity, can be replaced only by trained customers	Through the usual channel. Requires 2 days training.

Cleaning kit contents

Part	Quantity
Cleaning brush	1
Lint-free cotton swabs	100

Part	Quantity
Cleaning belt brush	1
Plastic gloves	50
Lint-free cloths	50
Putty knife	1

Printer maintenance kit (PMK) contents

Content	Quantity
Cleaning kit	1
Scan-axis lubricant oil bottle	2
Carriage oiling felts	1 kit, 4 felts
Service-station caps	1 kit, 8 caps
White printhead cleaning blades	3
Orange printhead cleaning blades	3
Intermediate tanks	8
Grease and oil kit	1

For the latest information on kits available for your printer, and their contents, see http://hp.com.

NOTE: The contents of the kit may vary.

NOTE: Some keys are provided with the printer. See Safety precautions on page 3 to identify the one you may require for maintenance operations.

Use the keys only for accessing the intended doors and keep them always under your control. Store them in a safe and secure place.

Maintenance tools recommended but not provided

Sponge to clean the printhead cleaning pinch roller, driver, and diverter rods

Brush for cleaning dust and dried ink from components and surfaces	Lint-free cloth, for cleaning covers, sensors, and delicate parts (included in the cleaning kit, but some extra cloths may be needed)	Distilled water for general cleaning, or a general-purpose industrial cleaner (such as Simple Green) when indicated
Vacuum cleaner, handy or normal, with nozzle accessories	Flashlight, for general use	Folding steps, for general use
A flat screwdriver	Allen keys	Torx screwdriver set

Summary of maintenance operations

Maintenance operations for all substrates

Frequency	Maintenance operation	Cross-reference	Part number and description
Daily recommended	Check and clean the printheads	Check and clean the printheads on page 97	Cleaning kit
	Check and clean the left printhead cleaning blade	Clean the left printhead cleaning blade on page 140	Cleaning kit
Daily recommended (white ink only)	Check and clean the white caps	Clean the service-station caps on page 150	Cleaning kit
	Check and clean the FI tower	Check and clean the FI tower on page 142	
	Check and clean the white ink from the belt	Clean the substrate-advance belt on page 154	Cleaning kit
Weekly	Clean the aerosol nozzle plate and filters	Clean the aerosol nozzle plate and filters on page 143	Cleaning kit
	Clean the printhead cleaning roll diverter and rods	Clean the printhead cleaning roll diverter and rods on page 147	Cleaning kit
	Clean the service station caps	Clean the service-station caps on page 150	Cleaning kit
	Check and clean the left printhead cleaning blade	Clean the left printhead cleaning blade on page 140	Cleaning kit
Monthly	Clean the drop-detector rods	Clean the drop-detector rods on page 152	Cleaning kit
	Clean the substrate-advance belt	Clean the substrate-advance belt on page 154	Cleaning kit
	Clean the printhead-cleaning pinchwheel	Clean the printhead-cleaning pinchwheel on page 154	
	Clean the line sensor and the crash sensors	Clean the line sensor and the crash sensors on page 156	Cleaning kit
Every 4 months (white ink only)	Replace the white-ink service-station caps	Replace a damaged service-station cap on page 176	
	Replace the white-ink intermediate tank	Replace the white-ink intermediate tank on page 157	
	Clean the auxiliary printhead	Clean the auxiliary printhead on page 157	
	Check the plastic needles in the auxiliary printhead storage box	Check the plastic needles in the auxiliary printhead storage box on page 159	
Every 375 liters of ink	Replace the right printhead cleaning blades	Replace the right printhead cleaning blades on page 162	Printer maintenance kit
Every 750 liters of ink	Check the printhead cleaning system	Check the printhead cleaning system on page 166	Printer maintenance kit
	Check the printhead cleaning fluid dispenser nozzle	Check the printhead-cleaning fluid-dispenser nozzle on page 168	Printer maintenance kit
	Clean the carriage cooling fan grid	Clean the carriage cooling fan grid on page 172	Printer maintenance kit
	Clean the curing perforated plate	Clean the curing perforated plate on page 174	Printer maintenance kit

Maintenance operations for all substrates (continued)

Frequency	Maintenance operation	Cross-reference	Part number and description
	Check the intermediate tanks and replace if necessary	Check and replace an intermediate tank on page 175	Printer maintenance kit
	Replace a damaged service-station cap	Replace a damaged service-station cap on page 176	Printer maintenance kit
	Replace the oiling felts	Replace the oiling felts on page 178	Printer maintenance kit
	Clean the carriage rails	Clean the carriage rails on page 181	Printer maintenance kit
	Clean the substrate-advance sensor	Clean the substrate-advance sensor on page 185	Printer maintenance kit
	Replace a curing PCA fan filter	Replace a curing PCA fan filter on page 188	Printer maintenance kit
	Clean the power-box fan filter	Clean the power-box fan filter on page 191	Printer maintenance kit
	Clean a curing PCA fan filter	Clean a curing PCA fan filter on page 193	Cleaning kit
	Clean the e-box fan filter	Clean the e-box fan filter on page 196	Cleaning kit
When required	Clean the printhead contacts	Clean the printhead contacts on page 200	
	Replace a spindle valve	Replace a spindle valve on page 203	
	Replace the curing fan and resistor module	Replace the curing fan and resistor module on page 204	
	Replace the spectrophotometer shutter	Replace the spectrophotometer shutter on page 206	
	Grease the printhead primers	Grease the printhead primers on page 208	
	Replace the left printhead cleaning blade	Replace the left printhead cleaning blade on page 210	Printer maintenance kit
	Empty the printhead cleaning waste bottle	Empty the printhead cleaning waste bottle on page 211	
	Replace the left spittoon foam	Replace the left spittoon foam on page 100	
	Replace an intermediate tank	Check and replace an intermediate tank on page 175	
	Replace all intermediate tanks	Check and replace an intermediate tank on page 175	
	Replace the e-box fan filter	Replace the e-box fan filter on page 213	Printer maintenance kit
	Replace a power-box fan filter	Replace the power-box fan filter on page 214	
	Replace an alignment-bar wheel	Replace an alignment-bar wheel on page 216	
	Replace the orange right printhead cleaning blade	Replace the right printhead cleaning blades on page 162	
	Replace the transparent right printhead cleaning blade	Replace the right printhead cleaning blades on page 162	
	Replace the right printhead cleaning blades	Replace the right printhead cleaning blades on page 162	

Maintenance operations for all substrates (continued)

Frequency	Maintenance operation	Cross-reference	Part number and description
	Replace the scan-axis bumps	Replace the scan-axis bumps on page 218	
	Replace the aerosol fan module	Replace the aerosol fan module on page 220	
	Replace the crash sensor legs	Replace the crash sensor legs on page 222	
	Replace a service-station cap	Replace a damaged service-station cap on page 176	Printer maintenance kit
	Replace the alignment bar	Replace the alignment bar on page 226	
	Replace the print-zone lights	Replace the print-zone lights on page 227	
	Replace the oiling felts	Replace the oiling felts on page 178	Printer maintenance kit
	Replace the printhead cleaning roll waste bottle	Replace the printhead cleaning waste bottle on page 228	
	Replace the plastic needles in the auxiliary printhead storage box	Replace the plastic needles in the auxiliary printhead storage box on page 230	
	Replace the auxiliary printhead	Replace the auxiliary printhead on page 231	

How to perform maintenance operations

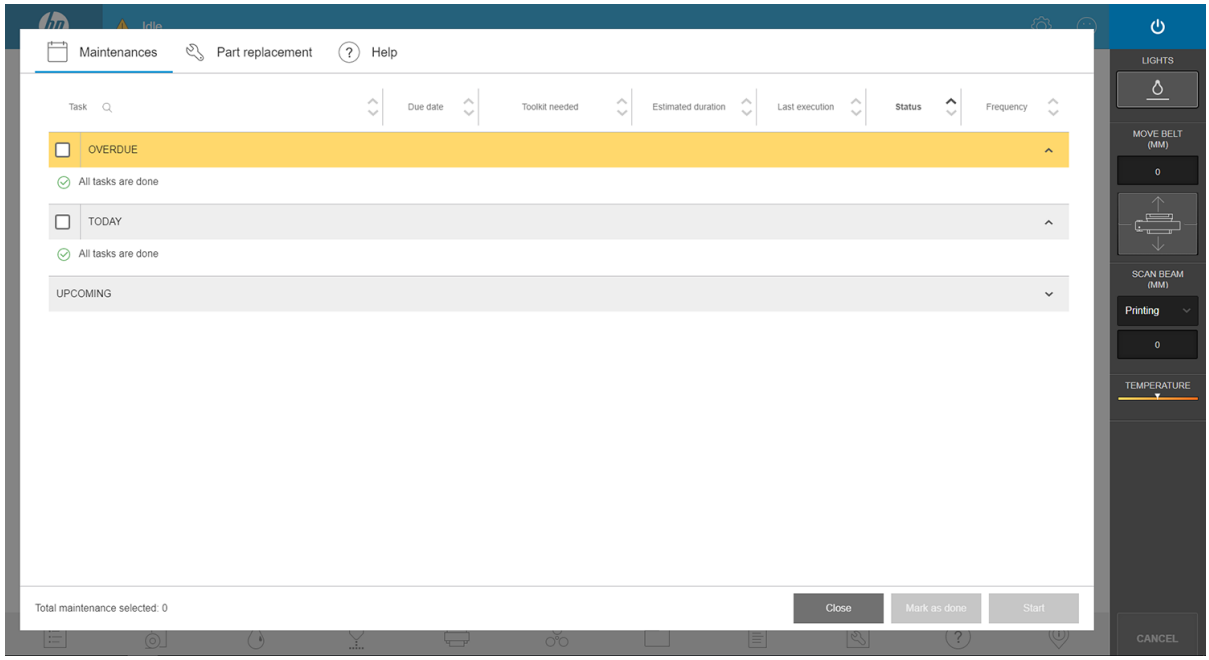
You can access maintenance information from the Internal Print Server.

Its functions are divided into the following categories:

- Maintenance widgets prompt you to perform maintenance tasks, and provide instructions on how to perform them. They can also list the maintenance tasks that have been performed in the past, and the printer messages that have been displayed in the past.
- Diagnostics apps can run functional tests on printer systems and components to check for failures and malfunctions. Each diagnostics run generates a report that provides detailed results and troubleshooting instructions. It can also list the tests that have been run in the past. See Diagnostics on page 234.

Perform maintenance tasks

If your printer is connected to the Internet, the Internal Print Server provides guidance (wizards) to help you to perform the maintenance operations correctly. Tap the maintenance operation and the wizard will appear; then follow its instructions.



IMPORTANT: Strictly follow all the recommended steps for safety reasons. For example, switching the printer off protects you from electric shock and hazardous moving parts, among other risks; it may also be required for other reasons.

IMPORTANT: Follow the steps to the end so that the appropriate alert is reset automatically.

The maintenance operations have the necessary buttons so that all printer actions, such as moving the carriage beam, can be launched directly when they are needed.

Instructions are provided to replace parts and resolve the most common failures.

Because this information is in the HP cloud, HP can update and improve it so that you will always have the latest version.

Perform maintenance without guidance

IMPORTANT: If your printer is not connected to the Internet, your maintenance operations could be obsolete.

HP strongly recommends an Internet connection as it keeps you up to date with the latest versions of the maintenance operations and automatic notification of firmware upgrades. Contact your service representative for more information.

IMPORTANT: Strictly follow all the recommended steps for safety reasons. For example, switching the printer off protects you from electric shock and hazardous moving parts, among other risks; it may also be required for other reasons.

Printer-system movements

To move the carriage beam, use the printer's quick-access buttons. Follow all safety precautions.

How to turn the printer off and on for maintenance operations

IMPORTANT: When performing maintenance operations, **always** turn the printer off and on as described below. Do not use the normal procedure.

IMPORTANT: Strictly follow all the recommended steps, for safety reasons.

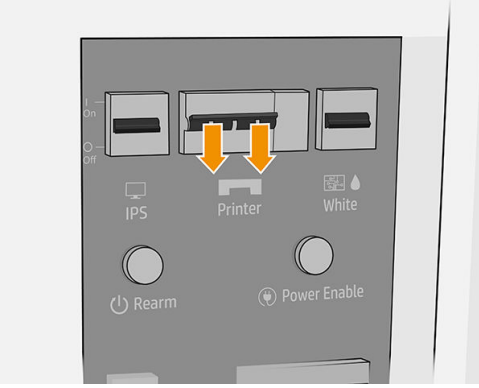
NOTE: If your printer is connected to the Internet, you do not need to remember these instructions, because they are included in the maintenance wizards.

Turn the printer off

1. Press the power button, and tap **Shut down**.

CAUTION: The shutdown process takes some time to complete. Wait until the green power light is off before proceeding.

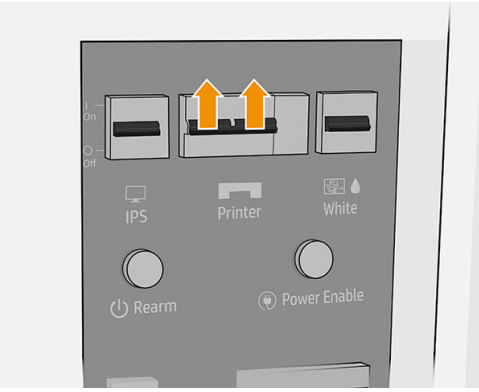
2. Turn off the printer using the main switch at the front right of the printer.



CAUTION: If you move the carriage manually in order to perform maintenance, the printhead carriage will not return to the normal position, and therefore the printheads will remain uncapped. Make sure the maintenance operation is done quickly to minimize the time in which the printheads are uncapped, and move the carriage back to the capping station as soon as possible.

Turn the printer on

1. Turn on the printer using the main switch at the front right of the printer.



2. Pay attention to the Internal Print Server and rearm the printer when requested, as usual.

CAUTION: In some maintenance procedures, the carriage beam is up when you turn on the printer, and the carriage moves during initialization. Avoid putting any part of your body in the print area.

Daily recommended maintenance

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

The following maintenance procedures are recommended daily:

- Check and clean the printheads
- Clean the left printhead cleaning blade

Check and clean the printheads

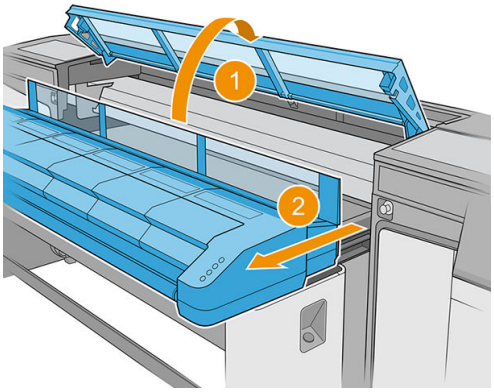
See Check and clean the printheads on page 97.

Clean the left printhead cleaning blade

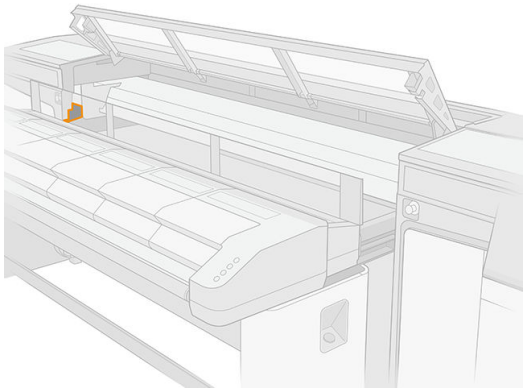
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

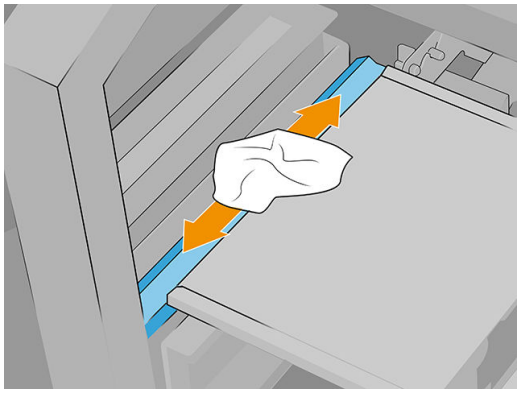
1. Open the top cover (1) and pull out the curing module (2).



2. Locate the left printhead cleaning blade at the left side of the print area, beside the left spittoon.



3. Clean the rubber blade with a lint-free cloth, and distilled water if necessary.



Daily recommended maintenance (white ink only)

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

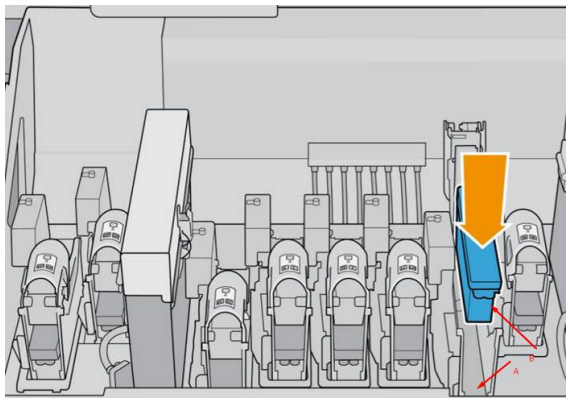
The following maintenance procedures are recommended daily:

- Check and clean the white caps
- Check and clean the FI tower
- Check and clean the white ink from the belt

Check and clean the white caps

See Clean the service-station caps on page 150.

Check and clean the FI tower



The FI tower (indicated by A) is the structure into which the printhead (B) is inserted, and through which the ink arrives at the printhead.

Whenever you remove a printhead, check whether the tower has a lot of ink on it. If so, clean it with a lint-free cloth before inserting a new printhead.

Check and clean the white ink from the belt

See Clean the substrate-advance belt on page 154.

Weekly maintenance

http://www.hp.com/go/latexRseries/weekly_maintenance

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

The following maintenance procedures are required weekly:

- Clean the aerosol nozzle plate and filters
- Clean the printhead cleaning roll diverter and rods
- Clean the service-station caps

Clean the aerosol nozzle plate and filters

Risk of burns

Crush hazard

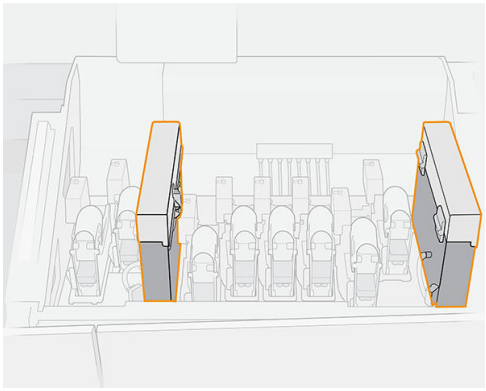
Risk of trapped fingers

Hazardous moving part

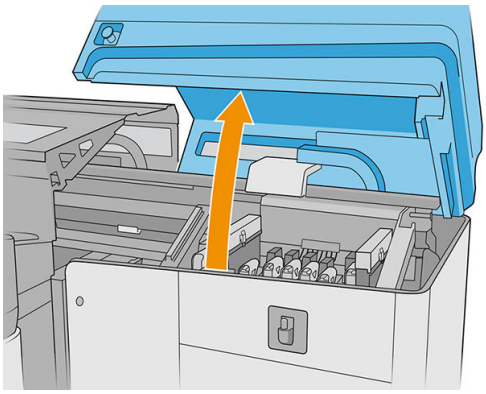
Electric shock hazard

For more safety information, see Safety precautions on page 3

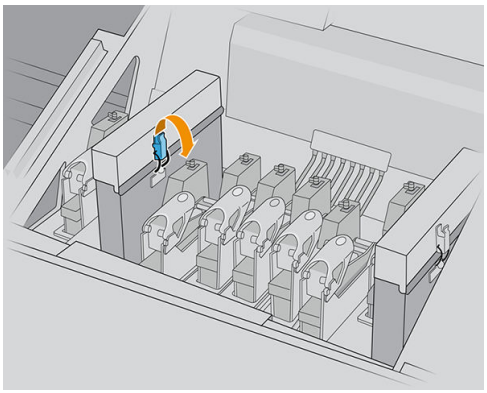
The aerosol nozzle plate and fliters should be kept clean for optimal performance and reliability. It is critical that when the nozzle plate is in some printing conditions with high scan beam or textile materials that more aerosol is generated, and blocks the aerosol removal system nozzle or filter.



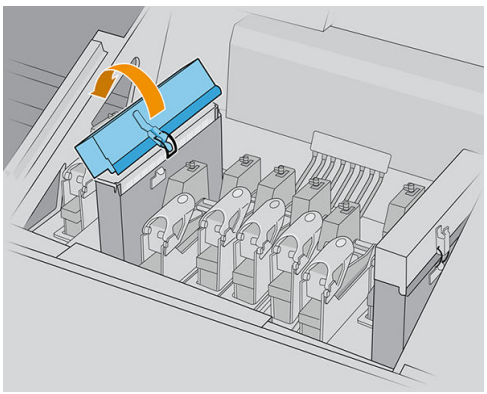
1. Open the carriage cover.



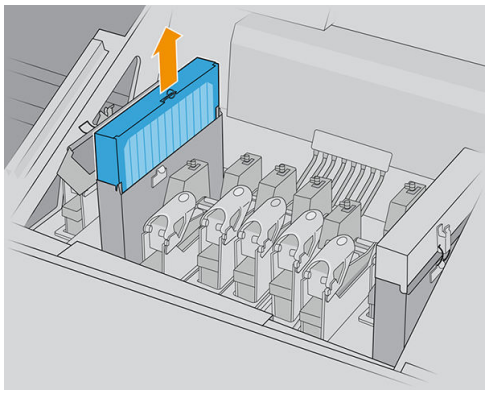
2. Open one latch on the right side of each aerosol filter module.



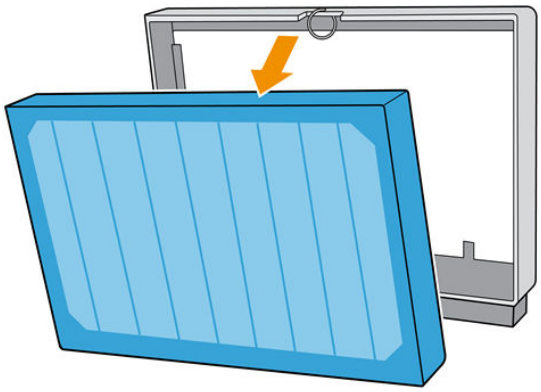
3. Open the lid of each filter.



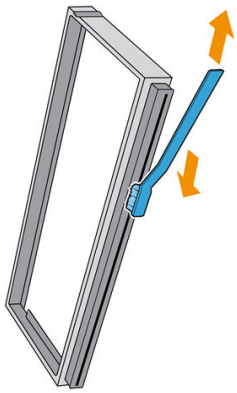
4. Remove both aerosol filter frames, using their handles.



5. Remove the filters from their frames.

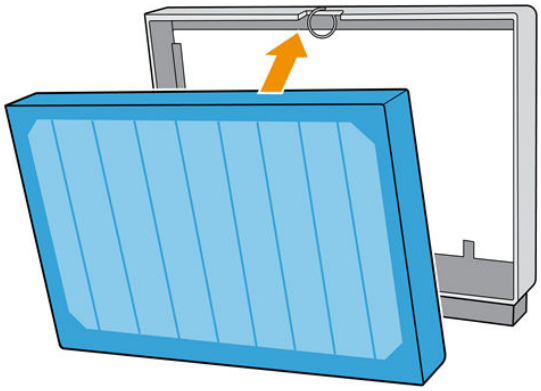


6. Use a flat screwdriver to remove the dry aerosol and then a brush to remove any remaining dirt from the filter frame. Try to avoid loose dirt falling into the frame.

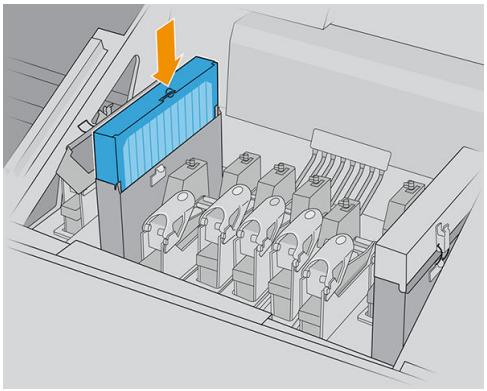


7. Put both filters back into their frames.

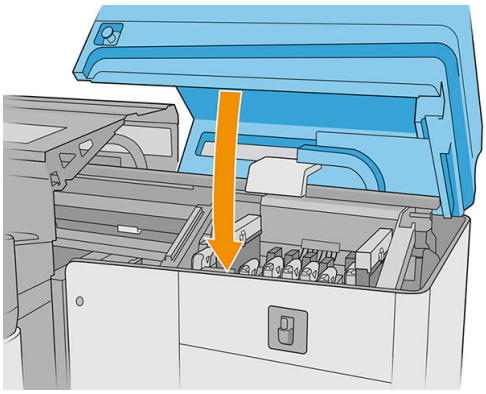
IMPORTANT: Reinsert the same filters that you were already using, unless prompted by the printer to replace them with new ones.



8. Reinsert both filter frames into the printer. There is only one way to insert them that works. If you feel resistance, try to insert the filter the other way round.



9. Close the lids.
10. Close the latches.
11. Close the carriage cover.



Clean the printhead cleaning roll diverter and rods

Risk of burns

Crush hazard

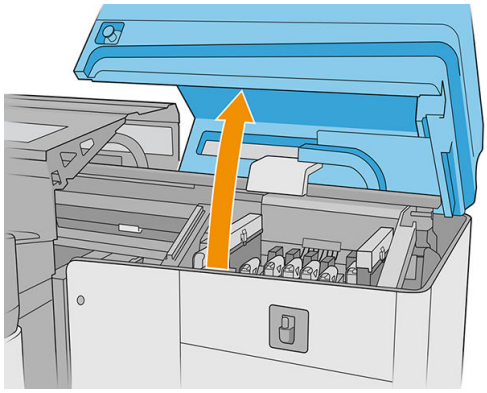
Risk of trapped fingers

Hazardous moving part

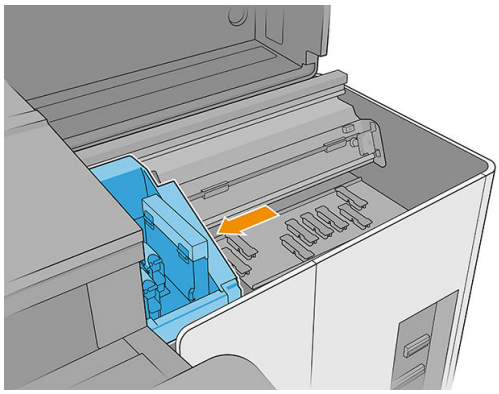
Electric shock hazard

For more safety information, see Safety precautions on page 3

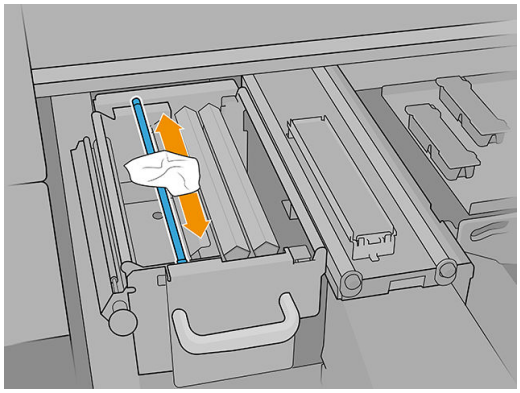
1. Open the carriage cover.



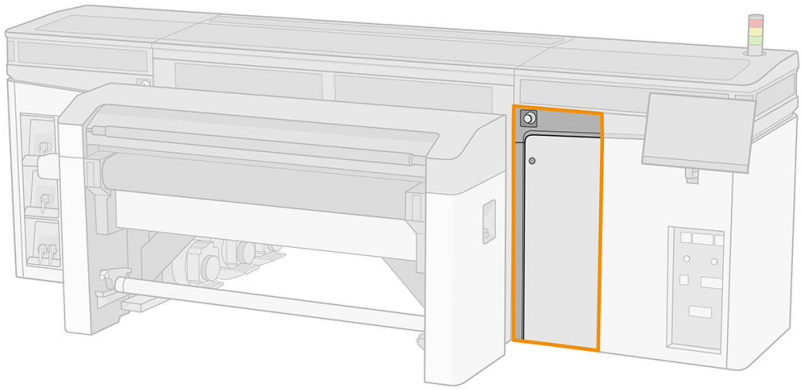
2. Move the carriage manually to the left.



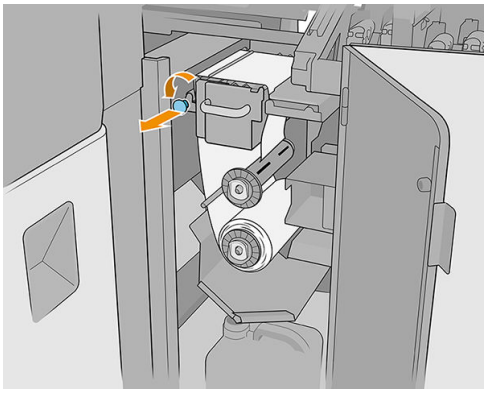
3. Clean the printhead-cleaning rubber-blade diverter and rods with a lint-free cloth dampened with distilled water. Ensure that no dried ink remains on the diverter.



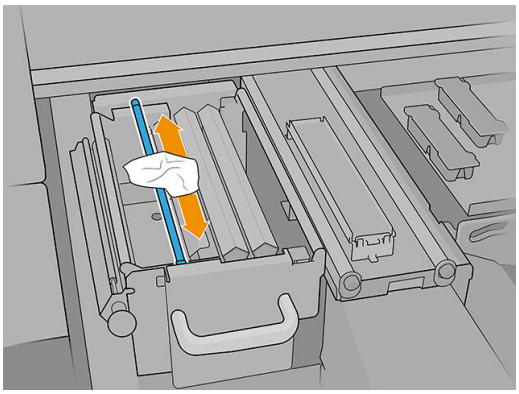
4. With the carriage cover still open, unlock and open the printhead cleaning roll door.



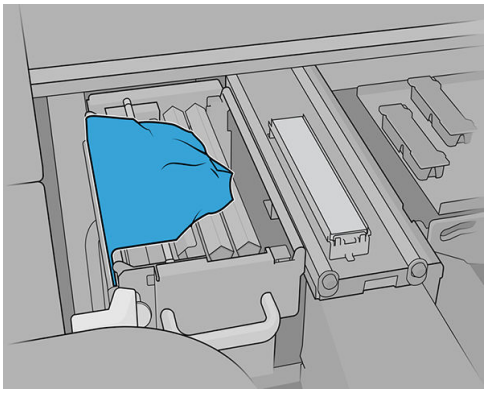
5. Pull out the black knob.



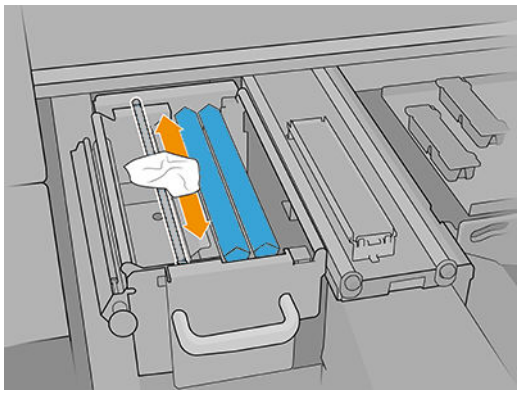
6. From the top, clean the rod with a lint-free cloth dampened with distilled water.



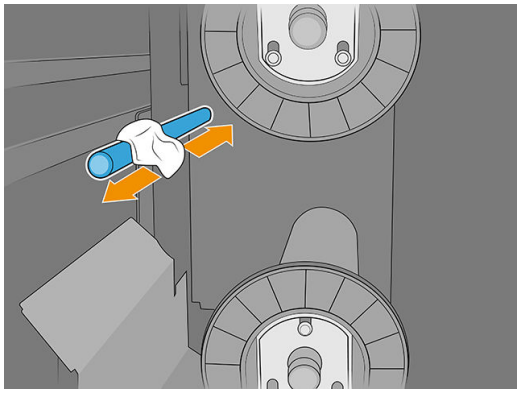
7. Move the material to the side to access the printhead-cleaning blades.



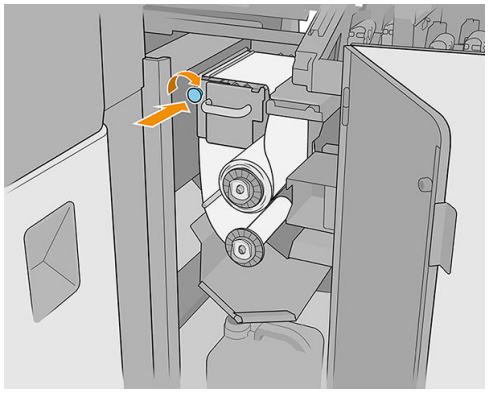
8. Clean both blades with a lint-free cloth dampened with distilled water.



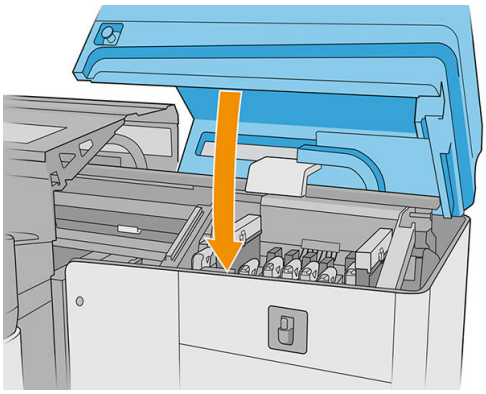
9. Move the material back to its original position.
10. Clean the rod in the middle of the cleaning-roll path with a lint-free cloth.



11. Restore the pinch mechanism by moving the black knob back into place.



12. Close the carriage cover.

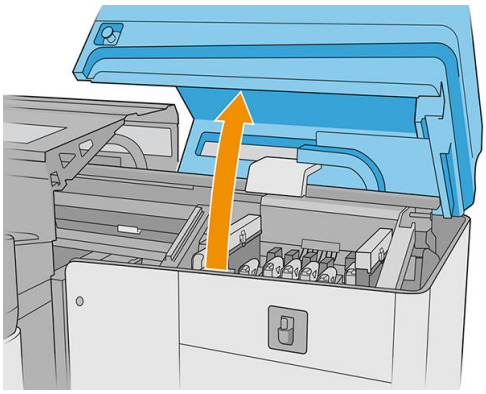


Clean the service-station caps

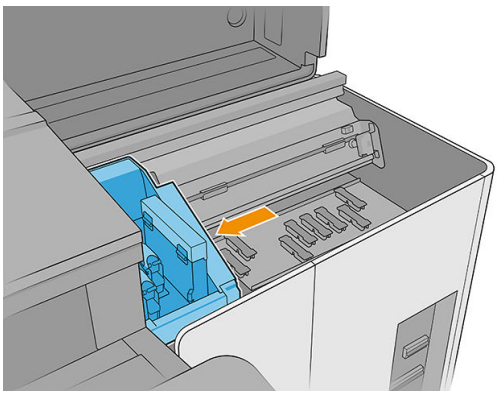
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

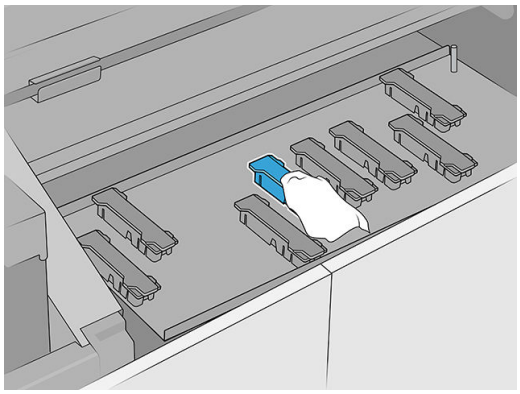
1. Open the carriage cover.



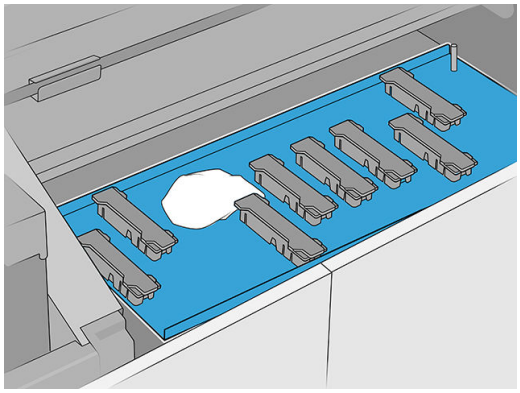
2. Move the carriage manually to the left in order to access the service station.



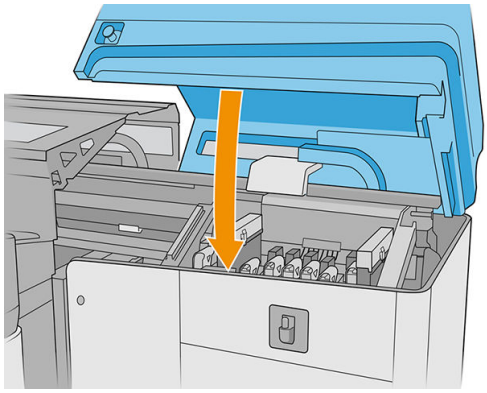
3. Clean the service-station caps with a lint-free cloth dampened with distilled water.



4. Clean the area around the service-station caps.



5. Move the carriage carefully back to the right until it stops.
6. Close the carriage cover.



Monthly maintenance

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

The following maintenance procedures are required monthly:

- Clean the drop-detector rods
- Clean the substrate-advance belt
- Clean the printhead-cleaning pinchwheel
- Clean the line sensor and the crash sensors

Clean the drop-detector rods

Risk of burns

Crush hazard

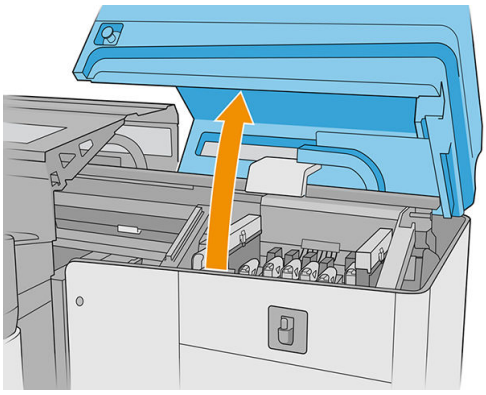
Risk of trapped fingers

Hazardous moving part

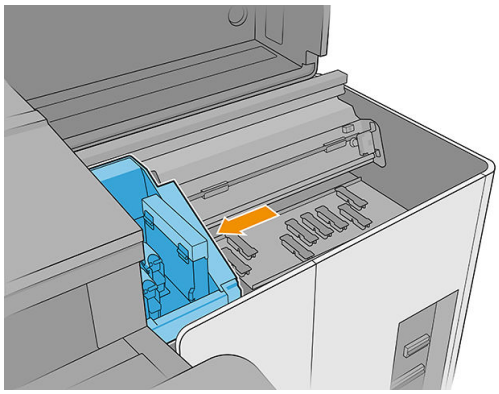
Electric shock hazard

For more safety information, see Safety precautions on page 3

1. Open the carriage cover.

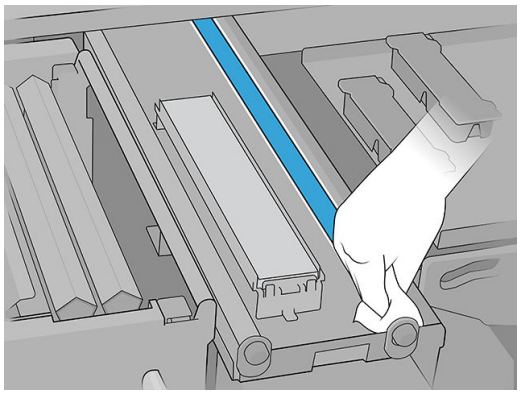


2. Move the carriage manually to the left.



3. Locate the drop detector and its rods.

4. Clean the rods with a lint-free cloth dampened with a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.



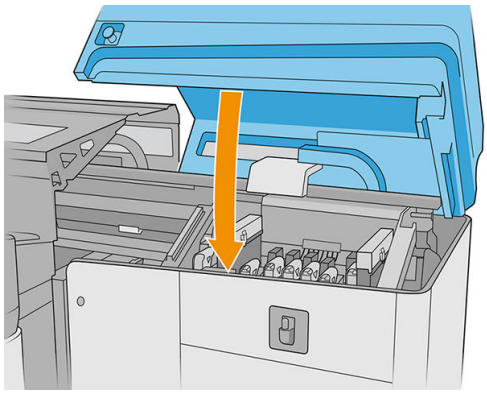
5. Lubricate the rods with two drops of oil on each rod: one at the center and another one at each end. Then put on gloves and spread the oil manually over the rod.

IMPORTANT: Make sure no oil falls onto the printhead cleaning roll: the oil would damage the roll and the printheads.

6. Remove any ink from the rods.

CAUTION: Be careful not to touch the drop-detector encoder strip.

7. Close the carriage cover.



8. Run a diagnostic test.

Clean the substrate-advance belt

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

1. If the extension tables are installed, remove them from the printer.
2. If there is a heavy accumulation of dried ink on the belt, remove most of it with a putty knife and then clean the area with a vacuum cleaner.

   IMPORTANT: Use the putty knife included in the cleaning kit.

3. Pour a general-purpose industrial cleaner (such as Simple Green) over the remaining dried ink on the belt or on the zone to be cleaned and wait for some seconds.
4. Use a brush to remove the ink from the belt.

   IMPORTANT: Brush the belt in the direction of the mesh.

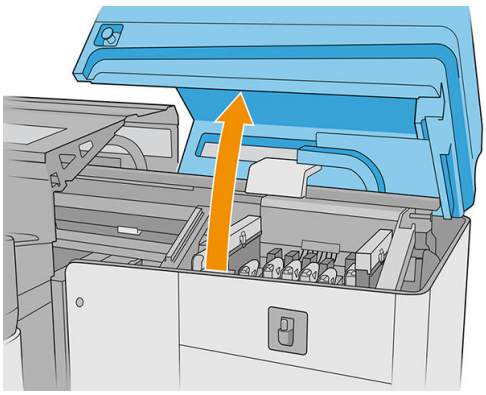
5. When the belt has been brushed clean, use a lint-free cloth to finish the cleaning process.
6. Move the belt backwards and forwards to clean all parts of it, repeating the above steps as needed.

Clean the printhead-cleaning pinchwheel

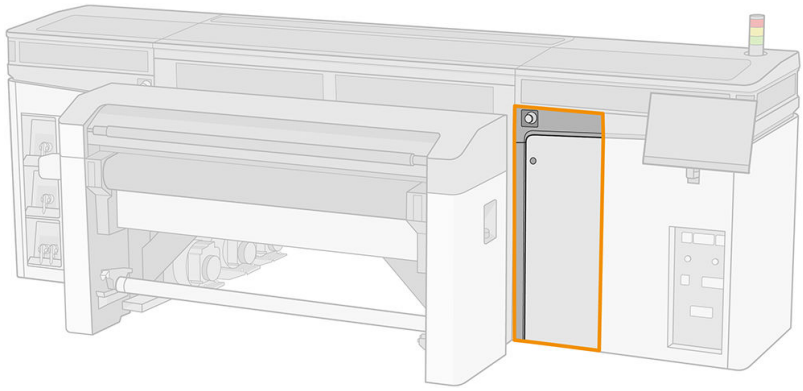
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

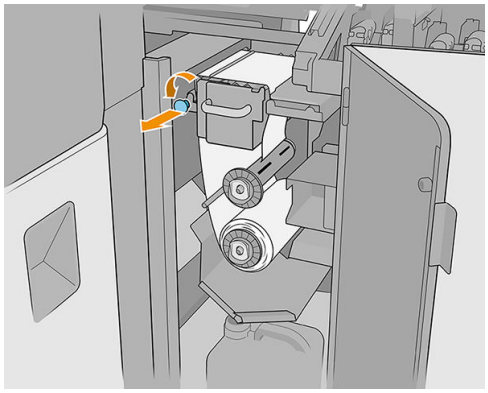
1. Open the carriage cover.



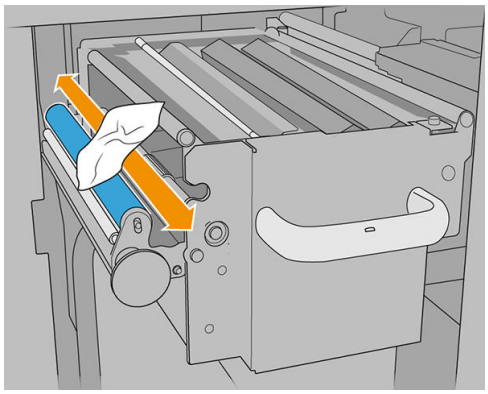
2. Open the printhead cleaning roll door.



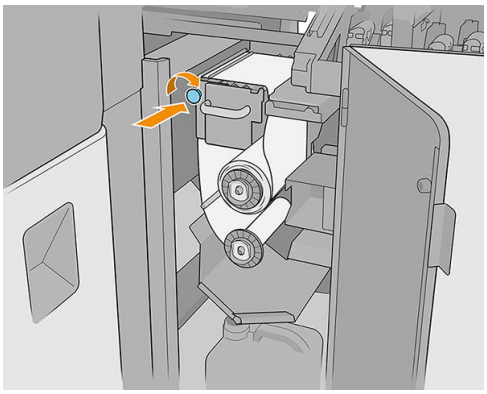
3. Open the pinchwheel, then pull out and rotate the black plastic knob.



4. Clean the pinchwheel with a sponge and distilled water. Ensure that no dried ink remains on the pinchwheel.



5. Close the pinchwheel using the black plastic knob.



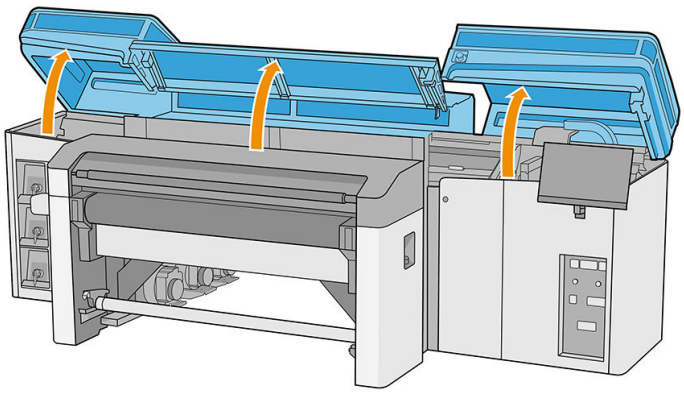
6. Close the printhead cleaning roll door and the carriage cover.

Clean the line sensor and the crash sensors

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

1. Move the scan axis to the service position.
2. Open the carriage cover and the top cover.



3. Open the curing module.
4. Move the carriage to the left until the crash sensor reaches the belt.
5. Use a lint-free cloth dampened with distilled water or a general-purpose industrial cleaner (such as Simple Green) to clean both crash sensors. Remove any remaining soap foam with a dry cloth.
6. Locate the line sensor under the carriage, and clean it with a lint-free cloth dampened with distilled water.
7. Move the carriage to the right until it reaches the service station.
8. Close the curing module.
9. Close the top cover and the carriage cover.

Every 4 months (white ink only)

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

The following maintenance tasks are recommended:

- Replace the white-ink service-station caps
- Replace the white-ink intermediate tank
- Clean the auxiliary printhead
- Check the plastic needles in the auxiliary printhead storage box

Replace the white-ink service-station caps

See Replace a damaged service-station cap on page 176.

Replace the white-ink intermediate tank

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

1. Go to the Internal Print Server and tap **Maintenance**.
2. Select the replacement of the white intermediate tank.
3. Follow the steps described on the screen.

Clean the auxiliary printhead

Risk of burns

Crush hazard

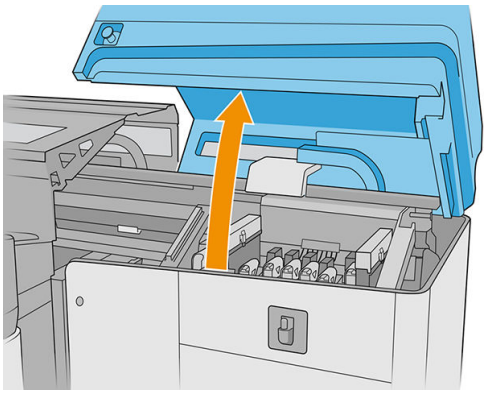
Risk of trapped fingers

Hazardous moving part

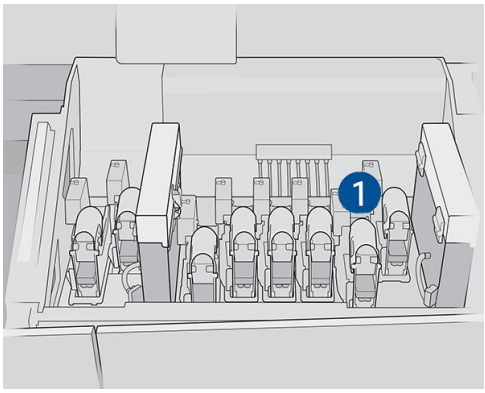
Electric shock hazard

For more safety information, see Safety precautions on page 3

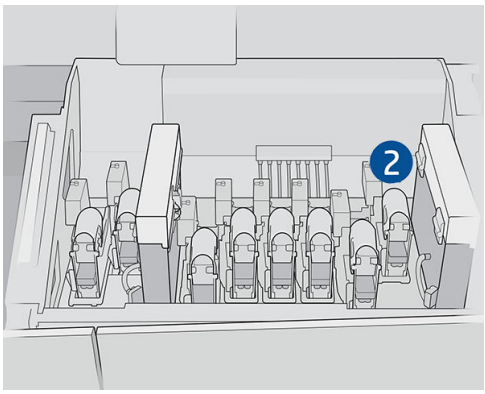
1. Open the carriage cover.



2. Remove the printhead or the auxiliary prinhead from white ink slot number 1.

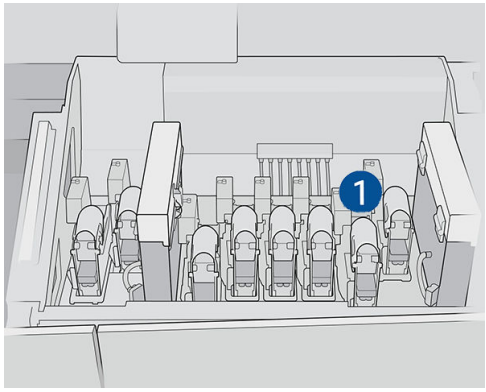


3. Make sure the corresponding auxiliary printhead is in slot number 2.



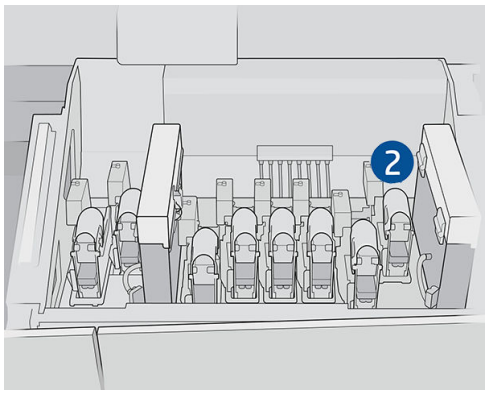
4. Start the checking process for the first auxiliary printhead.
5. Wait for the diagnostic result. If the status bar is green, the auxiliary printhead is working. If the status bar turns red, replace the auxiliary printhead with a new one.

6. Place the other auxiliary printhead in slot number 1.



7. Remove the already-checked auxiliary printhead from slot number 2.

IMPORTANT: Make sure you are checking the other auxiliary printhead.



8. Start the checking process for the second auxiliary printhead.
9. Wait for the diagnostic result. If the status bar is green, the auxiliary printhead is working. If the status bar turns red, replace the auxiliary printhead.
10. To finish this process, go to the Internal Print Server's home screen, tap the **Printheads** widget, and start a printhead replacement as usual.

Check the plastic needles in the auxiliary printhead storage box

Risk of burns

Crush hazard

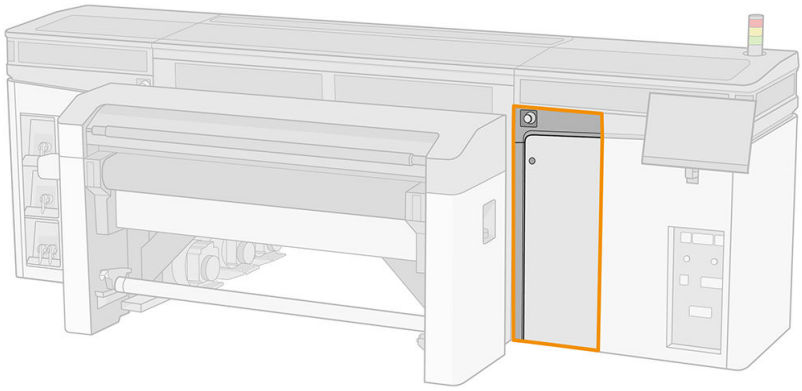
Risk of trapped fingers

Hazardous moving part

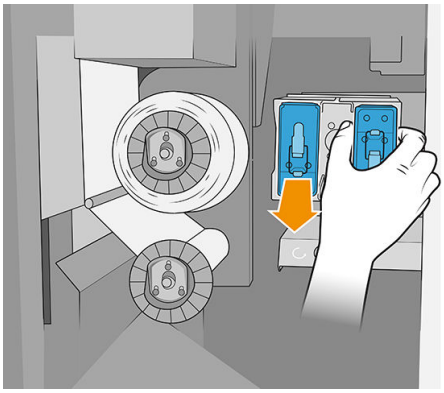
Electric shock hazard

For more safety information, see Safety precautions on page 3

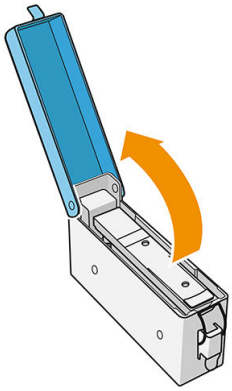
1. Open the printhead cleaning roll door.

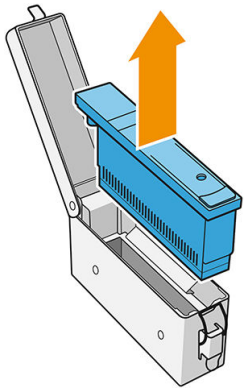


2. Remove the storage box from the wheel.



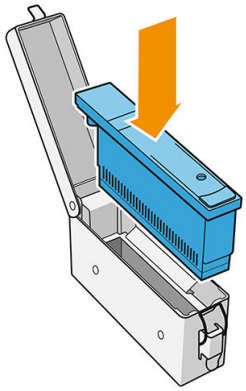
3. Open the storage box and remove the printhead inside, whether the auxiliary or the white printhead.





4. Check the plastic needles and clean off any ink remaining on them.

5. Reinsert the printhead that was in the storage box, and close the box.



6. Put the storage box back into the wheel.
7. Close the printhead cleaning roll door.

375 liter maintenance

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

The following maintenance procedures are required every 375 liters:

- Replace the right printhead cleaning blades

Replace the right printhead cleaning blades

Risk of burns

Crush hazard

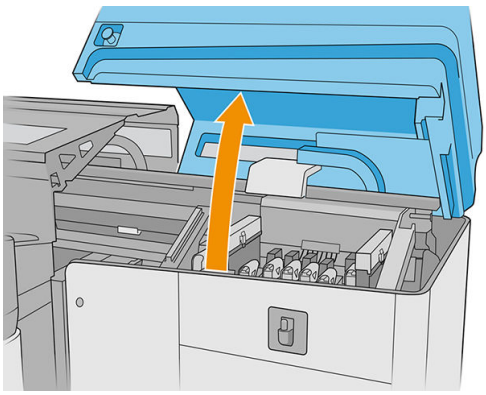
Risk of trapped fingers

Hazardous moving part

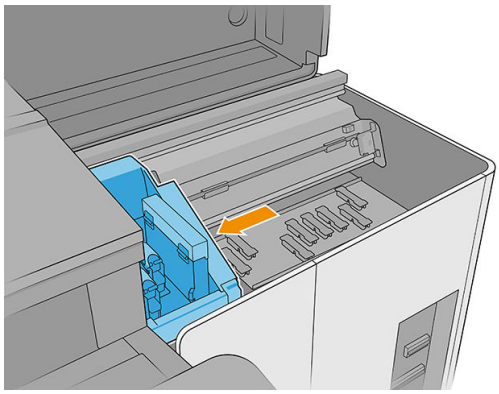
Electric shock hazard

For more safety information, see Safety precautions on page 3

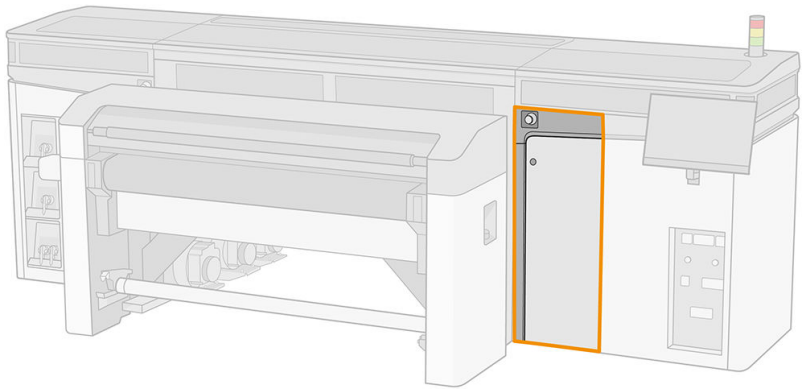
1. Ensure that you have the printer maintenance kit, and look in it for the two blades (hard and soft) to be replaced.
2. Ensure that the printer is not printing.
3. Open the carriage cover.



4. Manually move the carriage to the left.

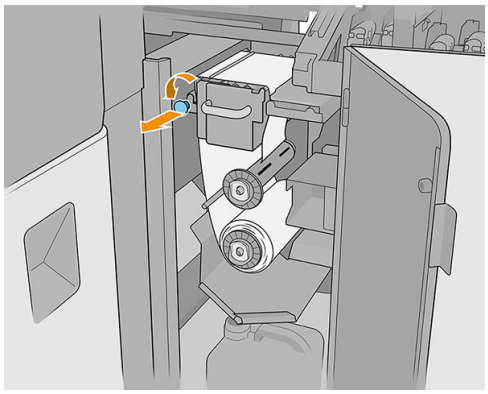


5. Unlock and open the printhead cleaning roll door.

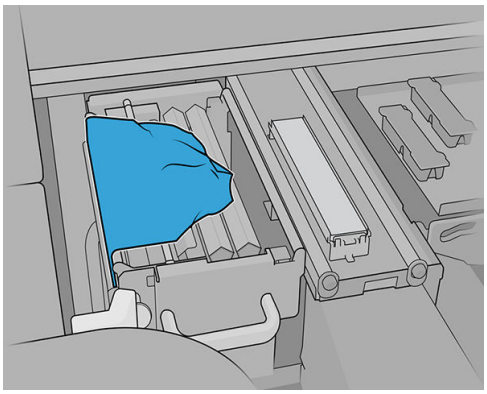


6. Put on gloves to protect your hands.

7. Pull the black knob on the upper left and move the pinch mechanism aside.

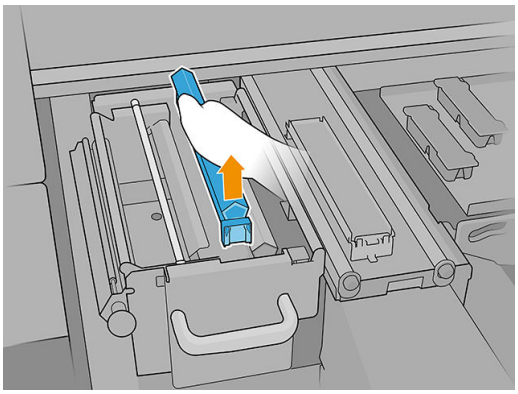


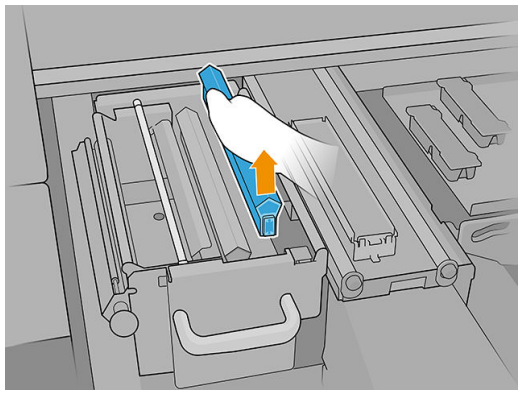
8. Move the printhead cleaning material aside in order to uncover the printhead cleaning blades.



9. Grip each printhead cleaning blade in the center and pull it out.

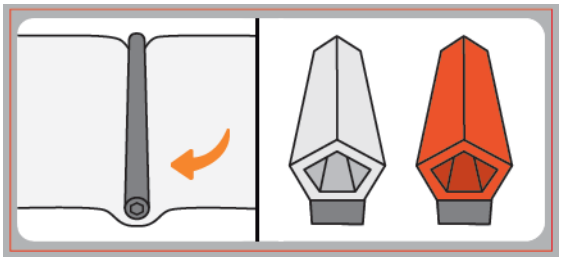
⚠ CAUTION: Be careful not to damage the water dispenser nozzle.



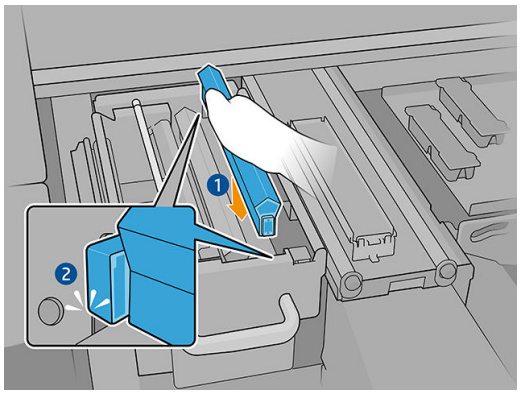


10. Place the new blades into position (see label).

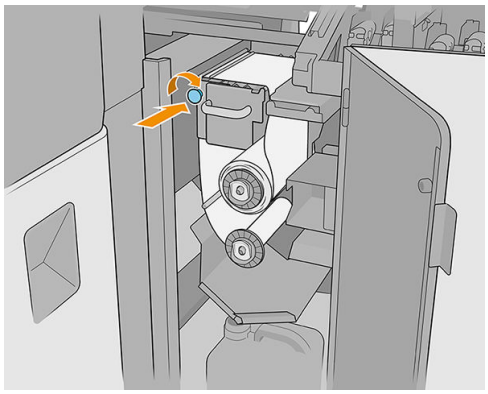
⚠ CAUTION: Be careful not to damage the printhead cleaning material.



11. Ensure that the black element remains firmly in place on the corresponding printer support.



12. Push the printhead cleaning material back into place and close the pinchwheel (using the black plastic knob).



13. Close and lock the printhead cleaning roll door.
14. Close the carriage cover.
15. Calibrate the printhead cleaning blade.

IMPORTANT: The printer will automatically calibrate the soft orange blade first, and the hard transparent blade second.

CAUTION: Do not open the carriage cover while diagnostics are running.

750 liter maintenance

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

The following maintenance procedures are required every 750 liters:

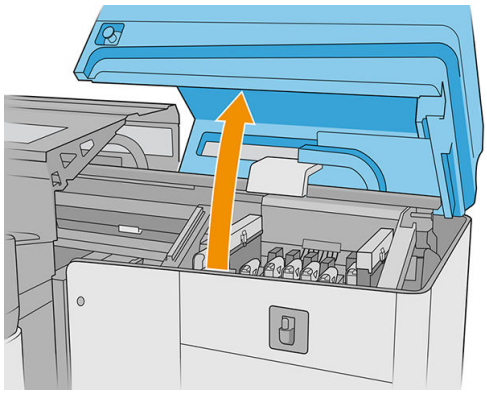
- Check the printhead cleaning system
- Check the printhead-cleaning fluid-dispenser nozzle
- Clean the carriage cooling fan grid
- Clean the curing perforated plate
- Check and replace an intermediate tank
- Replace a damaged service-station cap
- Replace the oiling felts
- Clean the carriage rails
- Clean the substrate-advance sensor
- Replace a curing PCA fan filter
- Clean the power-box fan filter
- Clean a curing PCA fan filter
- Clean the e-box fan filter

Check the printhead cleaning system

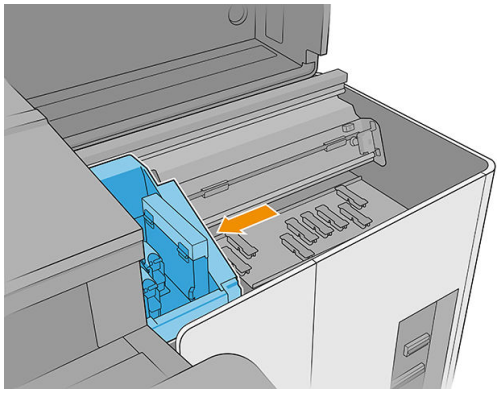
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

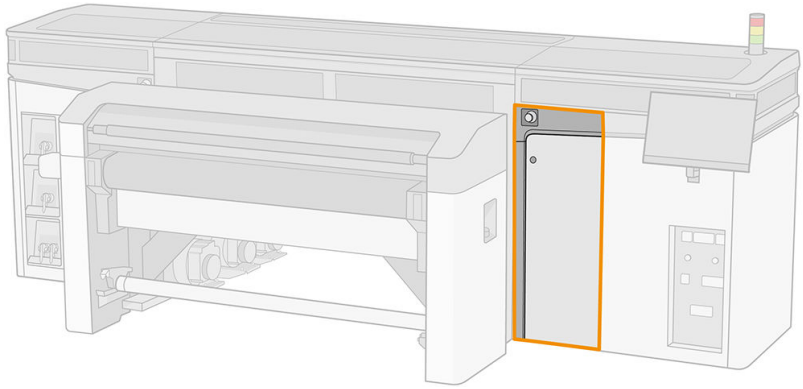
1. Open the carriage cover.



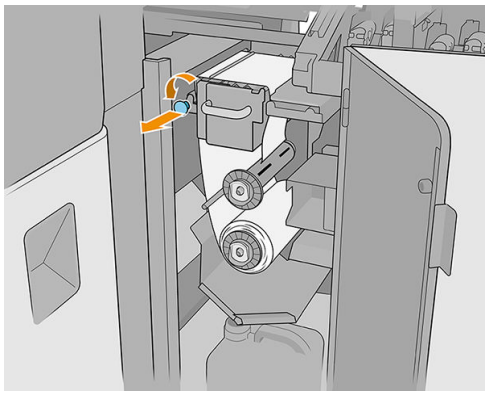
2. Manually move the carriage to the left.



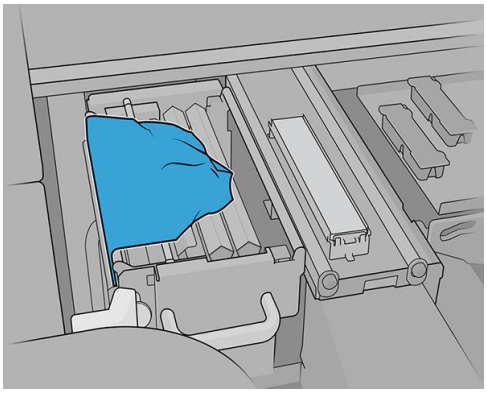
3. Unlock and open the printhead cleaning roll door.



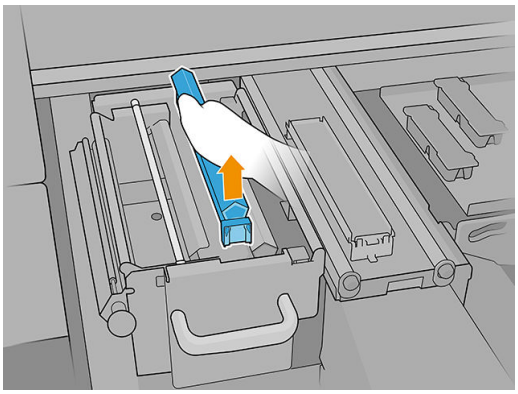
4. Pull the black knob on the upper left and move the pinch mechanism aside.

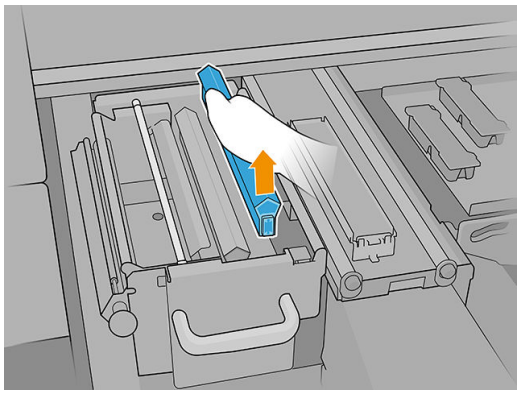


5. Move the printhead cleaning material aside to check that the printhead cleaning blades, diverter, rods, and surfaces are clean.



6. Remove the blades to check the drilling hole.





IMPORTANT: If anything is not clean, you can either clean it immediately or wait for the next printhead cleaning roll replacement, when the whole system should be thoroughly cleaned.

Check the printhead-cleaning fluid-dispenser nozzle

Risk of burns

Crush hazard

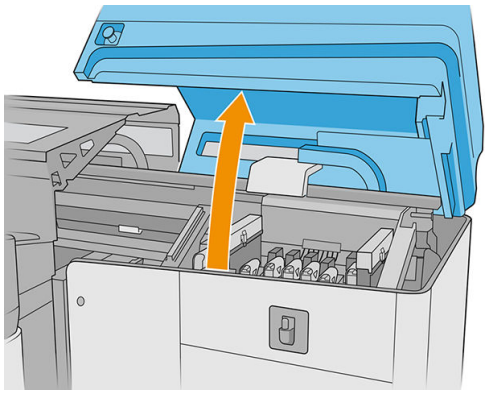
Risk of trapped fingers

Hazardous moving part

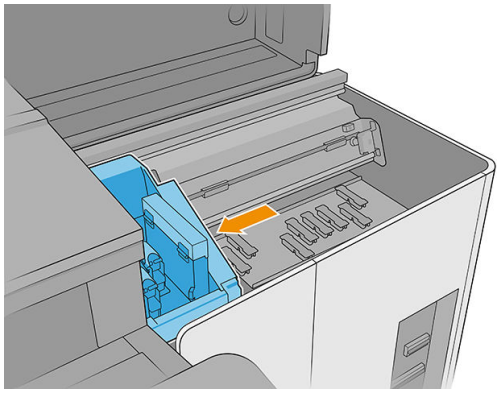
Electric shock hazard

For more safety information, see Safety precautions on page 3

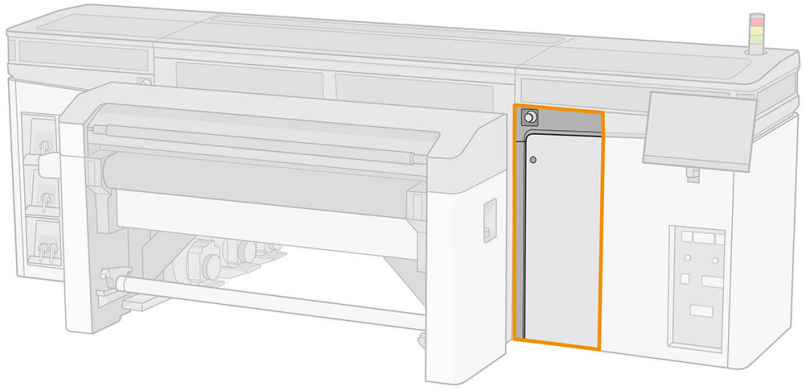
1. Open the carriage cover.



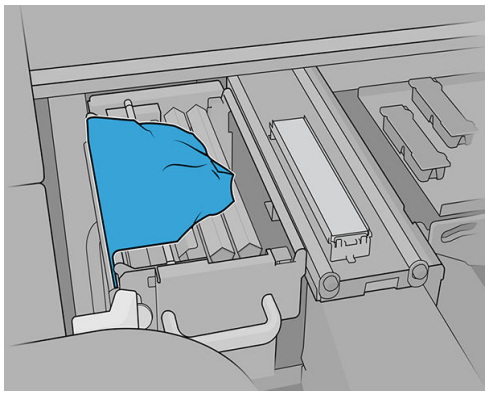
2. Manually move the carriage to the left.



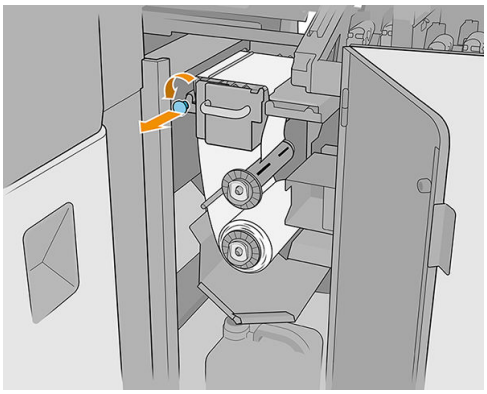
3. Unlock and open the printhead cleaning roll door.



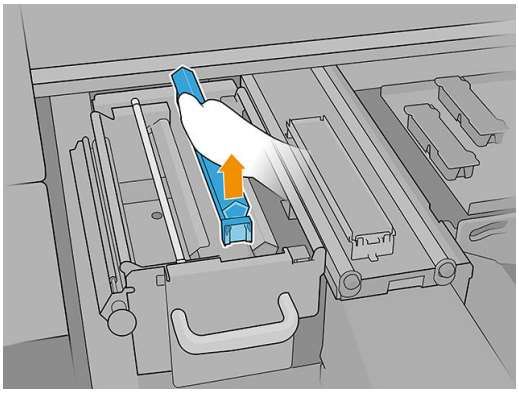
4. Move the printhead cleaning material aside to uncover the printhead cleaning blades.



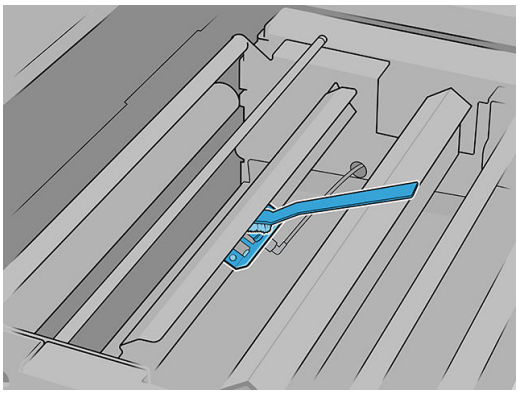
5. Pull the black knob on the upper left and move the pinch mechanism aside.



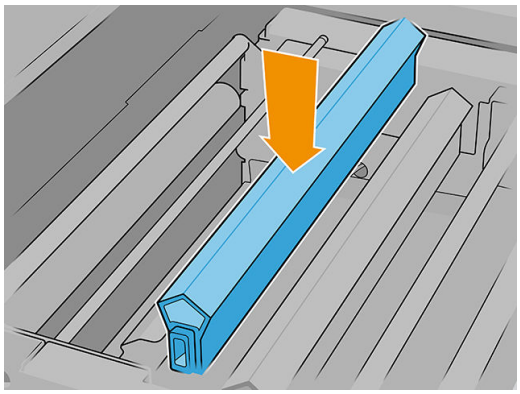
6. Remove one of the printhead cleaning blades to check the fluid dispenser nozzle.



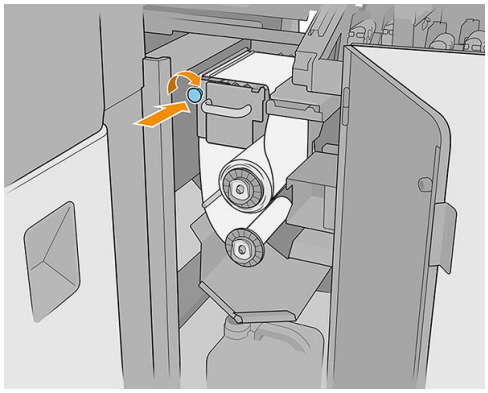
7. If the nozzle is clogged with ink, clean it with a brush dampened with distilled water or a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.



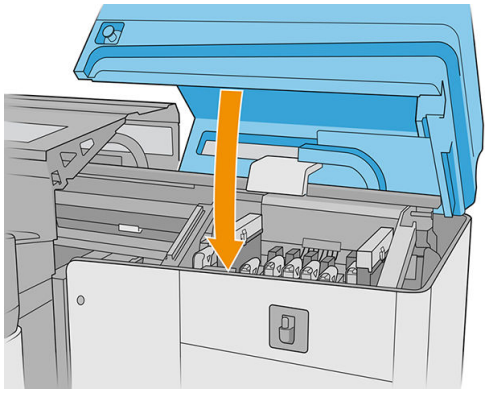
8. Reinstall the printhead cleaning blade and the printhead cleaning material.



9. Tighten the printhead cleaning roll and close the pinchwheel.



10. Close the printhead cleaning roll door.
11. Close the carriage cover.

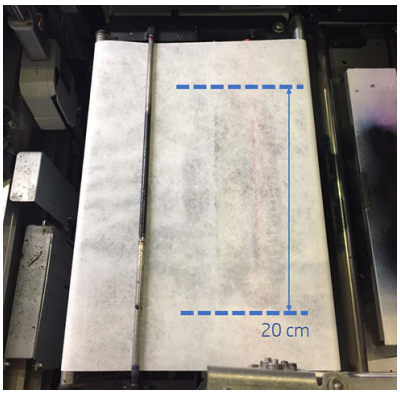


12. Start the checking process for the fluid dispenser nozzle, in which the fluid dispenser nozzle will deposit fluid on the printhead cleaning material.

⚠ CAUTION: Wait for the diagnostic result. If the status bar turns red, repeat the test. If the status bar is green, check the result, following the instructions in the next step.

IMPORTANT: The carriage cover must be closed during this process. Open it only to check the result, and close it before finishing the process.

13. The footprint should be similar to the one in the illustration.



If it is not, go to the previous step and repeat the process.

If the footprint is correct, continue to the next step.

Clean the carriage cooling fan grid

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

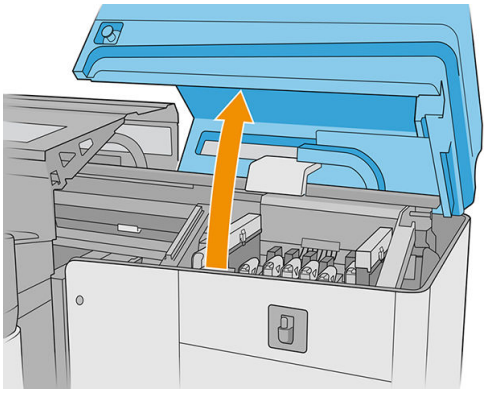
Electric shock hazard

For more safety information, see Safety precautions on page 3

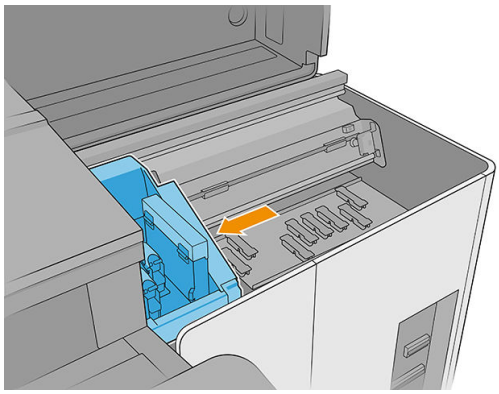
1. Ensure that the printer is not printing.
2. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

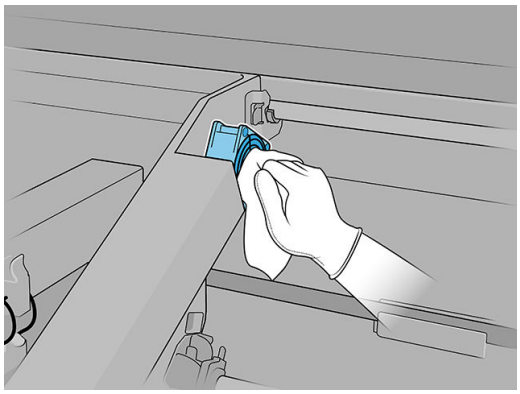
3. Open the carriage cover.



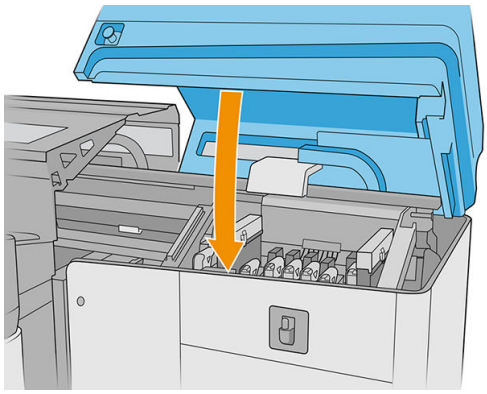
4. Manually move the carriage to the left in order to access the carriage cooling fan.



5. Brush off any dried ink from the fan, then clean it with a lint-free cloth dampened with a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.



6. Ensure that the cleaned parts are completely dry and all vapor has totally evaporated.
7. Close the carriage cover.



8. Turn on the printer.
9. Wait until the rearm button blinks, then press the rearm button.
10. Wait until the printer has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

11. Tap **Next** to finish this maintenance operation.

Clean the curing perforated plate

Risk of burns

Crush hazard

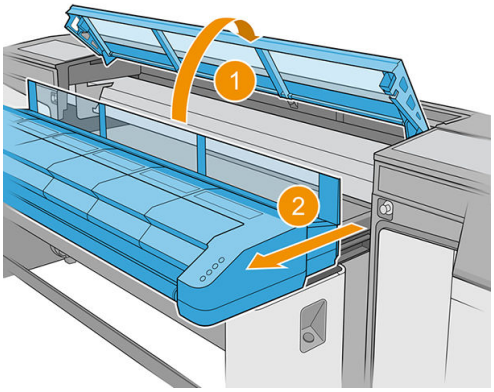
Risk of trapped fingers

Hazardous moving part

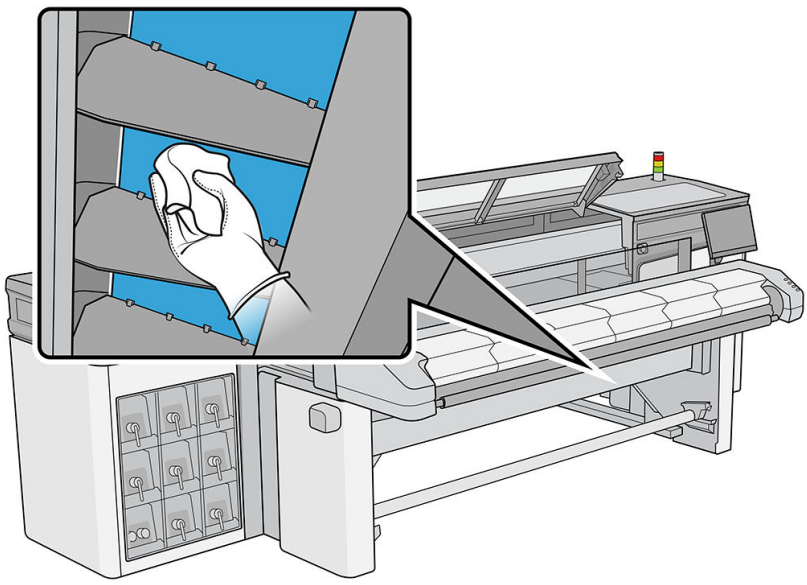
Electric shock hazard

For more safety information, see Safety precautions on page 3

1. Open the top cover (1) and pull out the curing module (2).



2. Lie on the floor in order to clean underneath the curing module.



3. Use a lint-free cloth dampened in a general-purpose industrial cleaner (such as Simple Green) to remove the ink completely from the plate.
4. Use a brush to remove ink from the holes.
5. Wait for the cleaner to evaporate.
6. Close the curing module and top cover.

Check and replace an intermediate tank

Crush hazard

Risk of trapped fingers

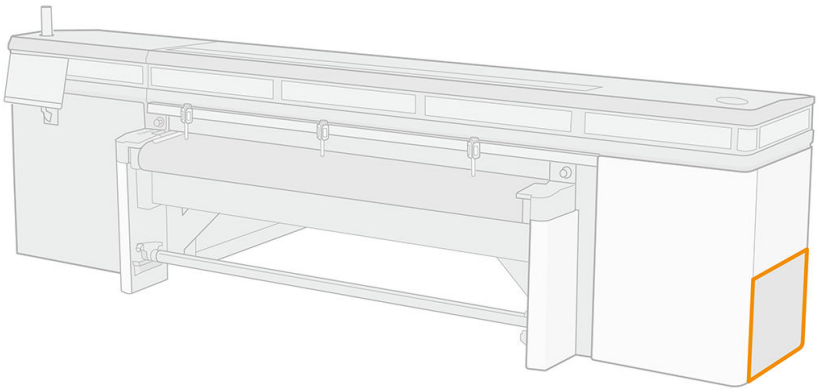
Hazardous moving part

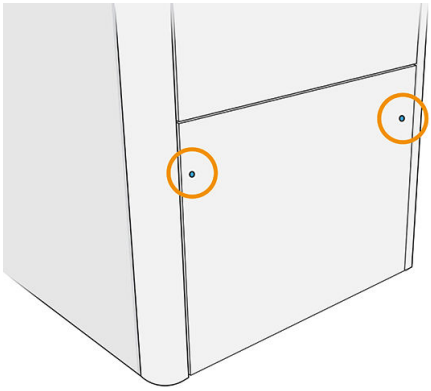
Electric shock hazard

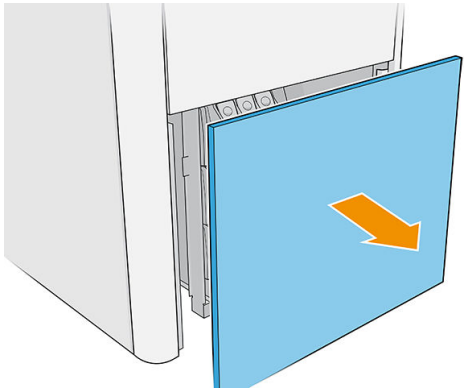
Moving fan blades

For more safety information, see Safety precautions on page 3

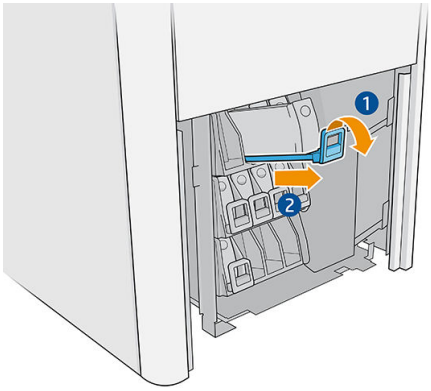
1. Ensure that you have the intermediate tank kit, which is included in the printer maintenance kit.
2. Ensure that the printer is not printing.
3. Follow the instructions on the screen to replace an intermediate tank.
4. Remove the cover when prompted by the printer.

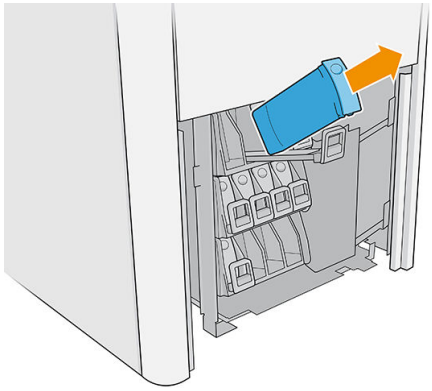




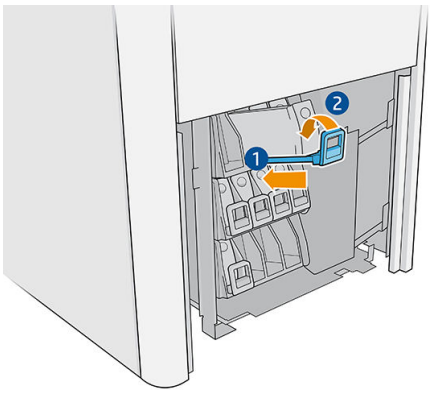


5. Remove the intermediate tank when prompted by the printer.





6. Place the appropriate colored label on the new intermediate tank.
7. Insert the new intermediate tank.



The printer automatically fills the intermediate tank, and detects when it is full.

8. Reinstall the cover.
9. Run a diagnostic test to check that the intermediate tank is working correctly.

Replace a damaged service-station cap

Risk of burns

Crush hazard

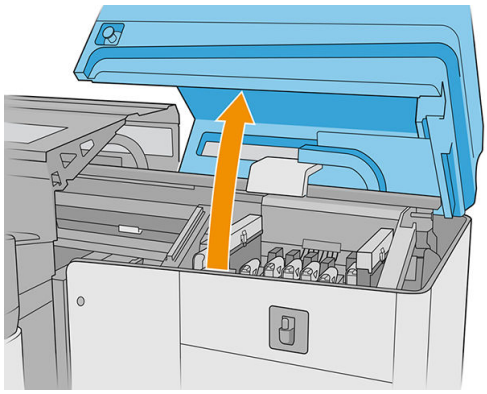
Risk of trapped fingers

Hazardous moving part

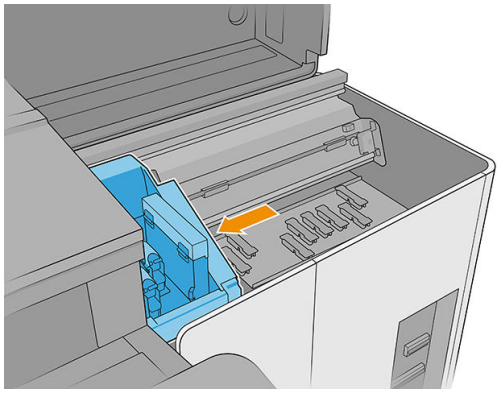
Electric shock hazard

For more safety information, see Safety precautions on page 3

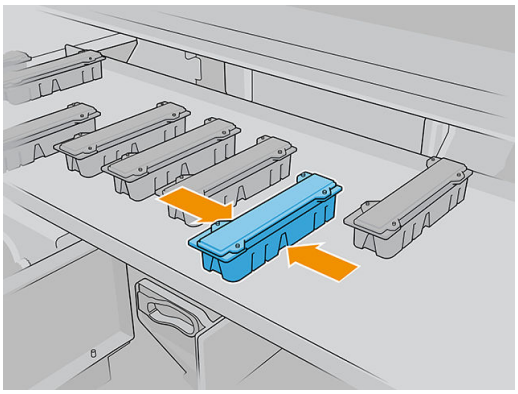
1. Open the carriage cover.

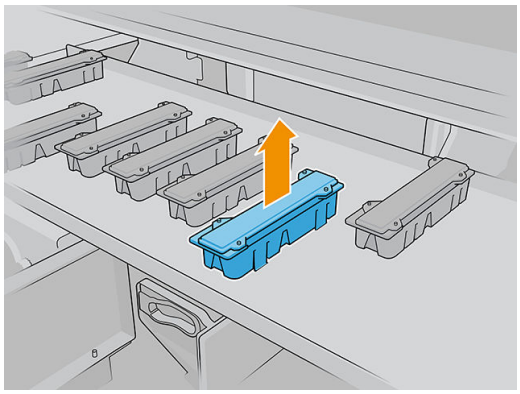


2. Move the carriage manually to the left in order to access the service-station caps.

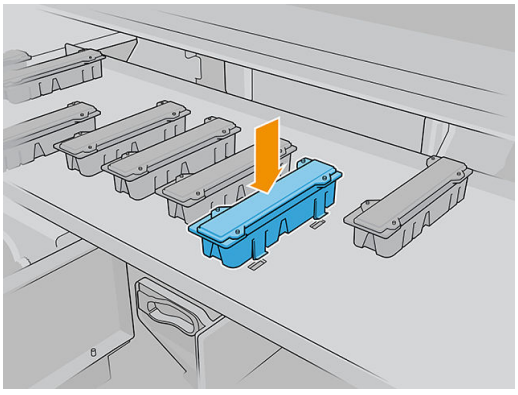


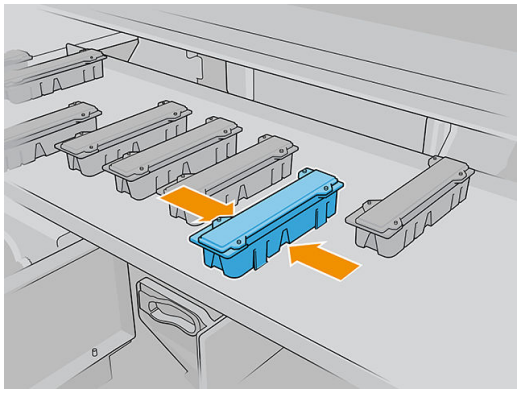
3. Remove the service-station cap by pressing on the four lateral fixings (two each side), and pulling up.





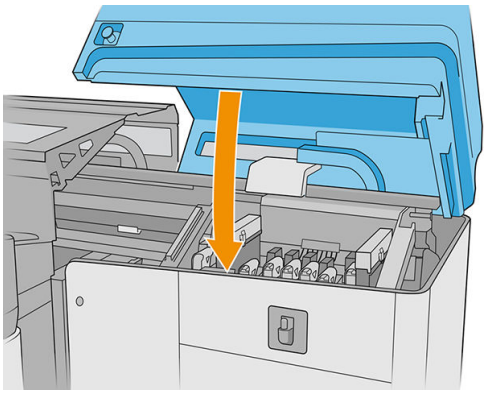
4. Install the new service-station cap, pressing the fixings to lock it into position.





IMPORTANT: When it is in place, ensure that the rubber surface that covers the service-station cap is correctly located on the four pins.

5. Close the carriage cover.



Replace the oiling felts

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

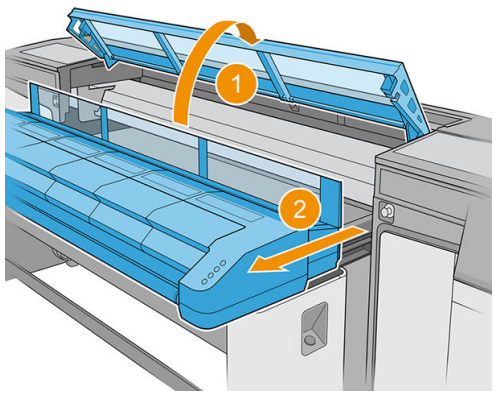
Risk of cutting fingers

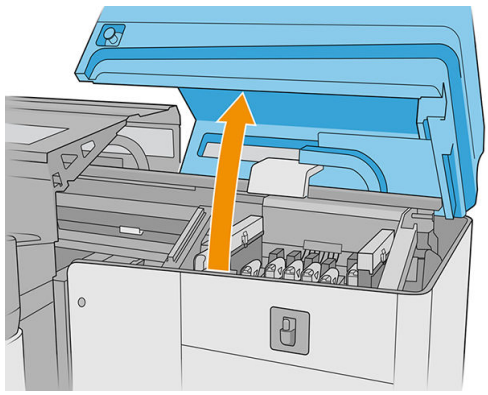
For more safety information, see Safety precautions on page 3

1. Ensure that you have the printer maintenance kit, which includes two right oiling felts, two left oiling felts, the required tools (Torx 8 and 3 mm Allen key) to remove and replace the screws holding them to the carriage and cloths.
2. You are recommended to wear gloves when manipulating oiled parts (not for fastening/unfastening screws).
3. Turn off the printer.

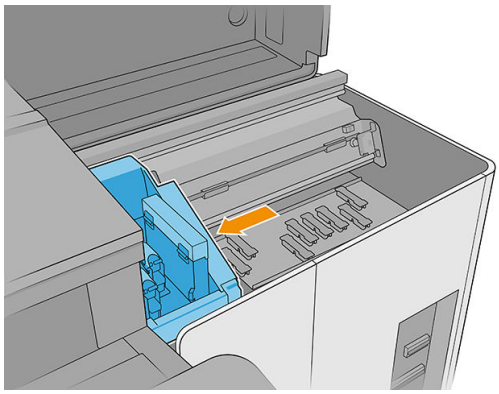
IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

4. Open the top cover, the curing module, and the carriage cover.



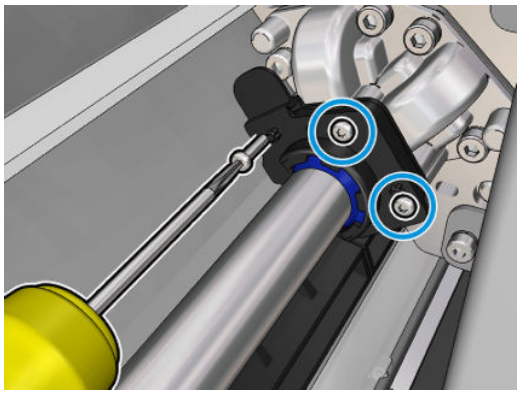


5. Move the carriage manually to the left until the right felts are accessible.

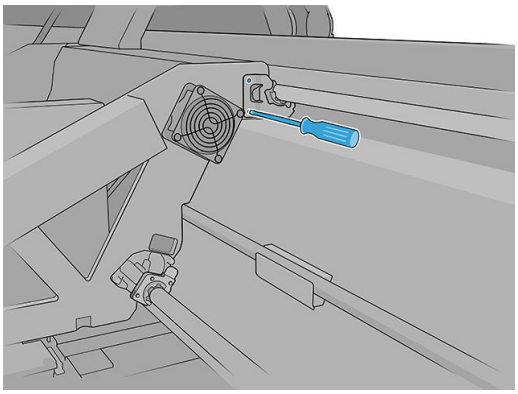


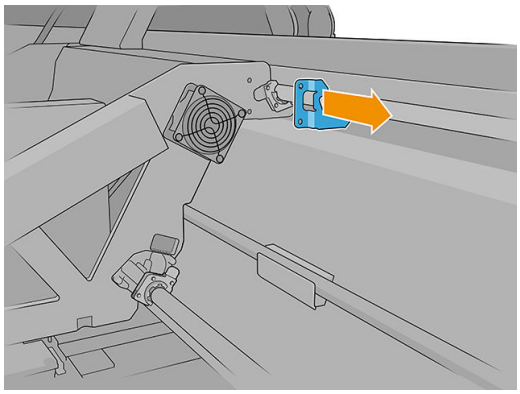
6. Remove the screws from the left oiling felts, using the Torx 8 and 3 mm Allen key.

IMPORTANT: Take care not to lose the screws once removed.

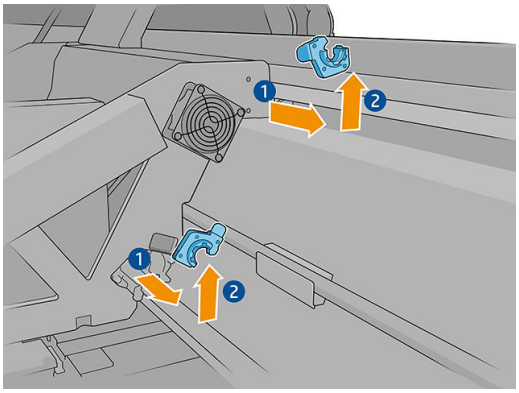


7. Remove and guard the metal part covering the rear oiling felt.



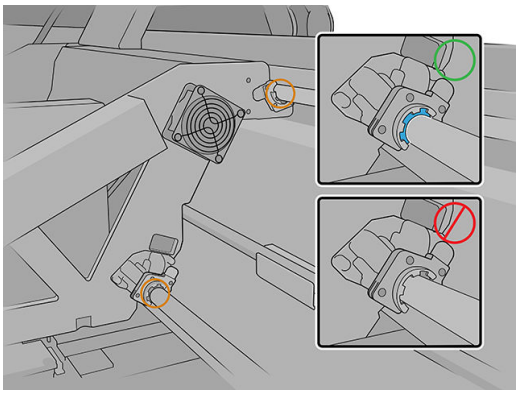


8. Move the felts to be replaced a few millimeters away from the carriage and then pull them out of the carriage rail (turning them clockwise or counterclockwise will help). Dispose of the used/dirty felts as waste material.

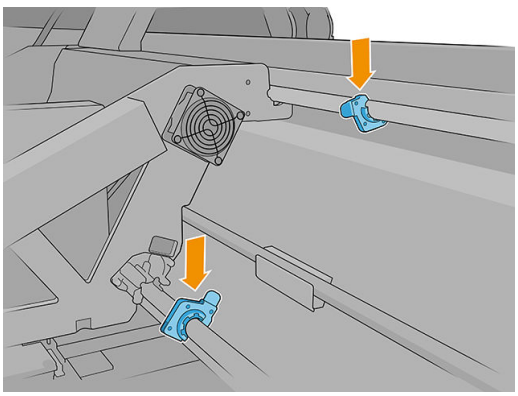


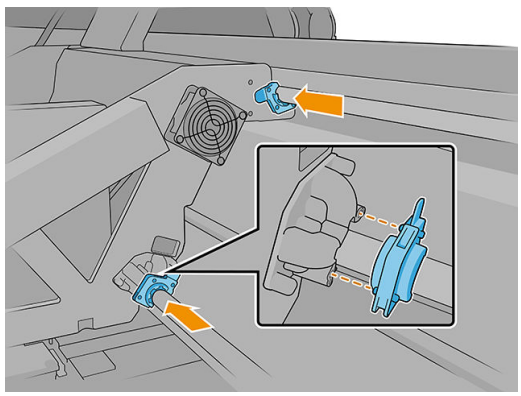
9. Take the two clean left oiling felts from the printer maintenance kit and install them.

   Once installed, the blue plastic part in the oiling felt should be outwards (not inwards).



10. Insert the oiling felts into each rail and slide towards the carriage. Notice the cross-shaped features in the oiling felt housing shown below have to go into the holes provided in the carriage. Also, for the rear oiling felt, two pins in the carriage should pass through holes in the oiling felt housing.





11. Replace the screws previously removed to attach the felts to the carriage.

NOTE: For the rear felt, replace the sheet metal part previously removed before replacing the screws.

12. Move the carriage manually to the right until the left felts are accessible.

13. Repeat the above operation for the left felts.

14. Close the carriage cover and top cover.
15. Turn on the printer.
16. Wait until the rearm button blinks, then press the rearm button.
17. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

18. Tap **Next** to finish this maintenance operation.

Clean the carriage rails

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

Risk of cutting fingers

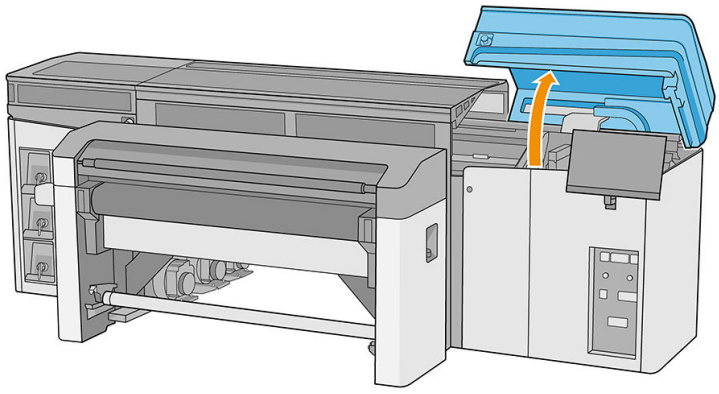
For more safety information, see Safety precautions on page 3

Clean the carriage rails (IPS side)

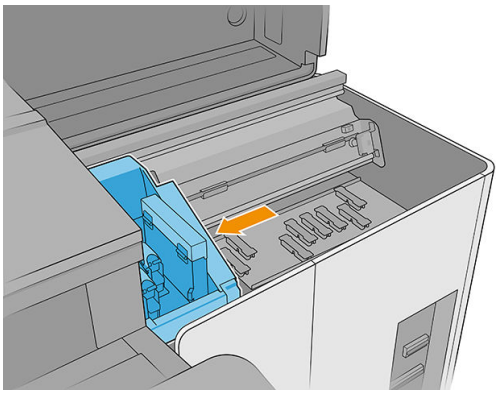
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

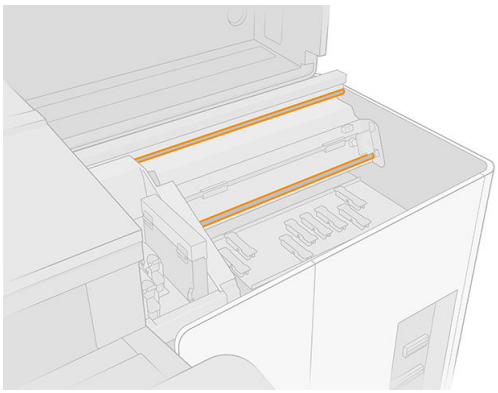
2. You are recommended to wear gloves when manipulating oiled parts (not for fastening/unfastening screws).
3. Open the carriage cover to access the carriage rails.



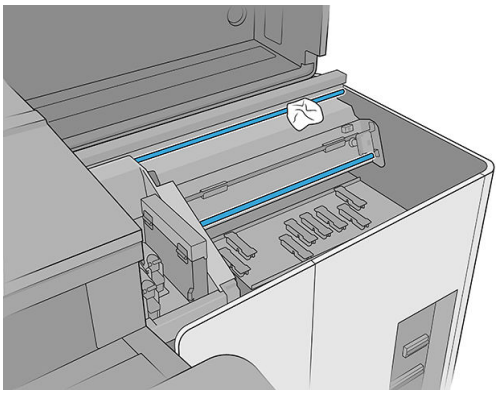
4. Move the printhead carriage to the left in order to access the rightmost part of the rails.

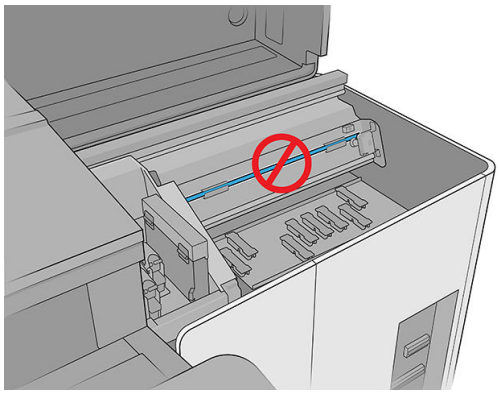


5. You will see a ring of dust on the top and the bottom rails, as shown below. Clean the rails with a lint-free cloth dampened with distilled water or a general-purpose industrial cleaner (such as Simple Green), if available. Remove any remaining soap foam with a dry cloth.

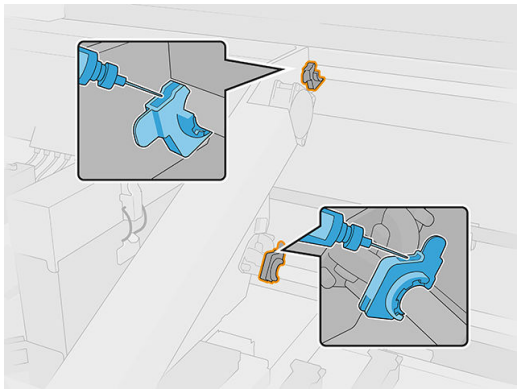


IMPORTANT: Take special care when cleaning the front lower rail to avoid cutting yourself with or breaking the encoder strip.

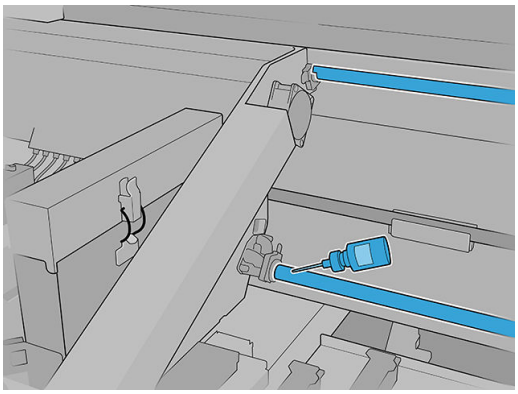


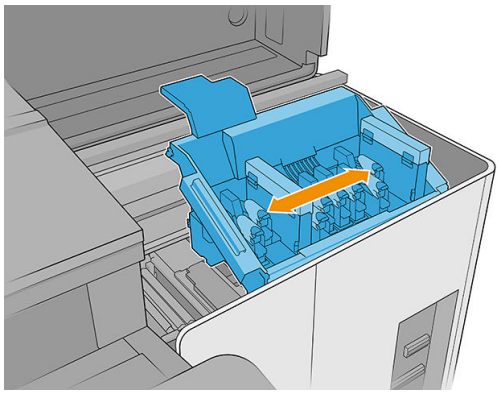


6. Allow the rails to dry, then lubricate them with a few drops of the lubricant provided in the printer maintenance kit.

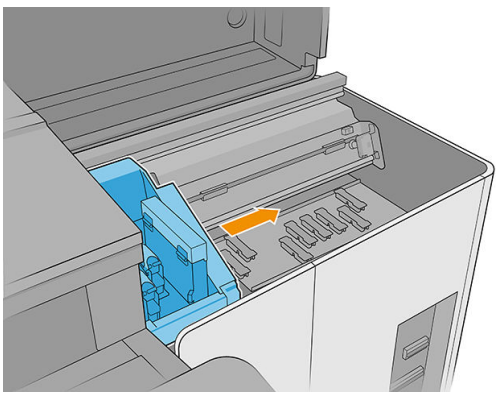


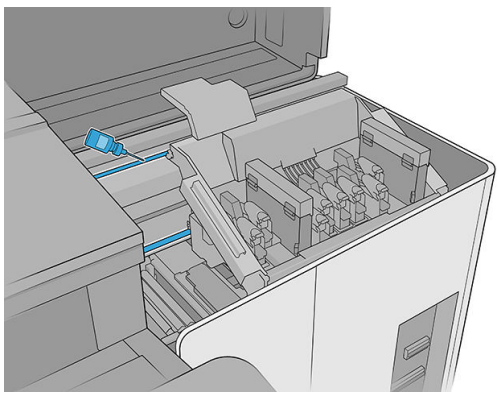
7. Move the carriage from side to side to spread the lubricant evenly over the rails.



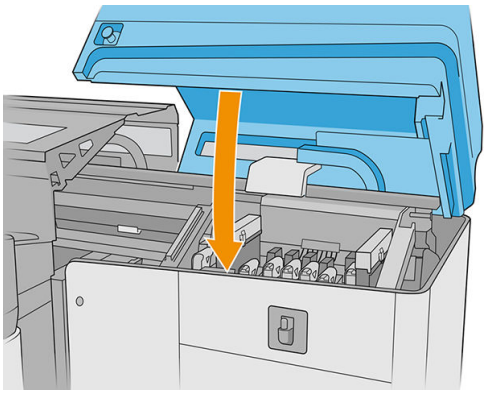


8. Move the carriage back to the right.





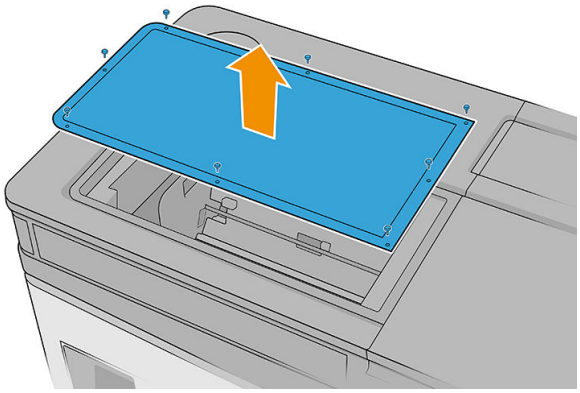
9. Close the carriage cover.



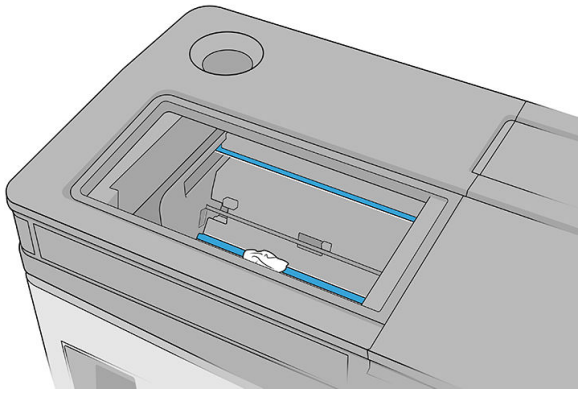
Clean the carriage rails (IDS side)

1. Remove the perforated surface of the top left cover to access the carriage rails.

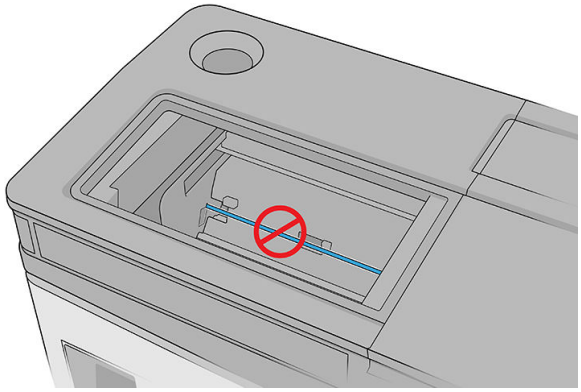
CAUTION: Take care not to damage the strip encoder.



2. You will see a ring of dust on the top and the bottom rails. Clean the rails with a lint-free cloth dampened with distilled water or with a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.



IMPORTANT: Take special care when cleaning the front lower rail to avoid cutting yourself with or breaking the encoder strip.



Finish cleaning the carriage rails

1. Put back the top left cover.
2. Turn on the printer.
3. Wait until the rearm button blinks, then press the rearm button.
4. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

5. Tap **Next** to finish this maintenance operation.

Clean the substrate-advance sensor

Risk of burns

Crush hazard

Risk of trapped fingers

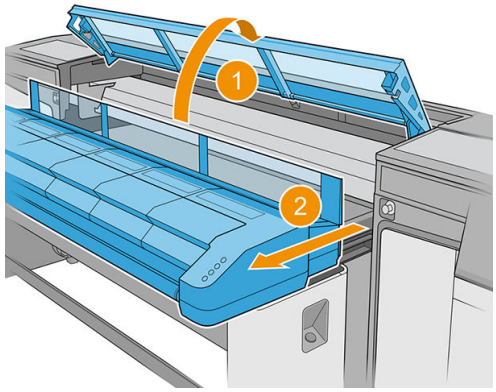
Hazardous moving part

Electric shock hazard

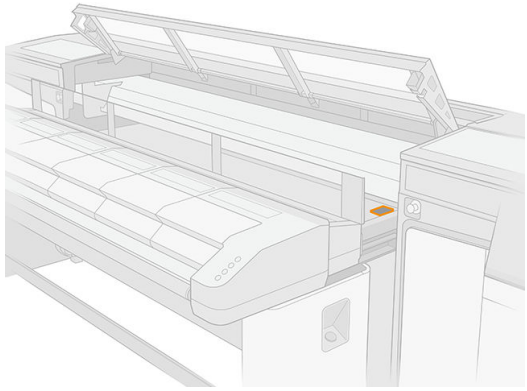
For more safety information, see Safety precautions on page 3

Under normal printing conditions, some dirt, dust, and ink aerosol can reach the substrate-advance sensor window and impair the performance of the sensor.

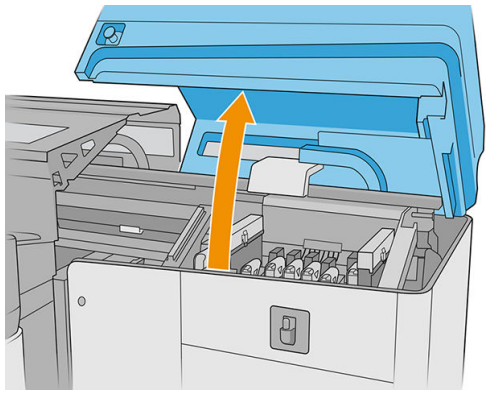
1. Open the top cover (1) and pull out the curing module (2).



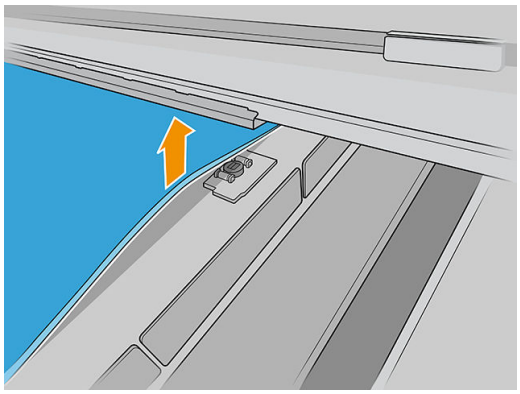
2. Locate the substrate-advance sensor.



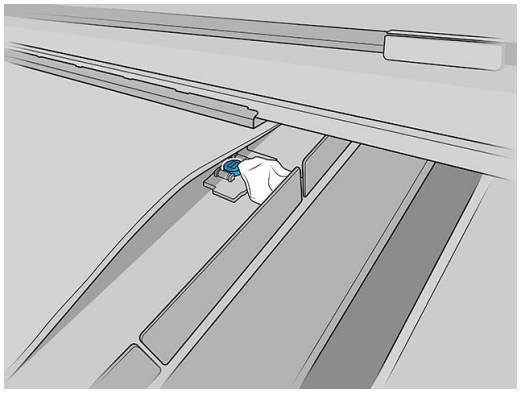
3. Open the carriage cover.



4. Raise the substrate-advance belt.

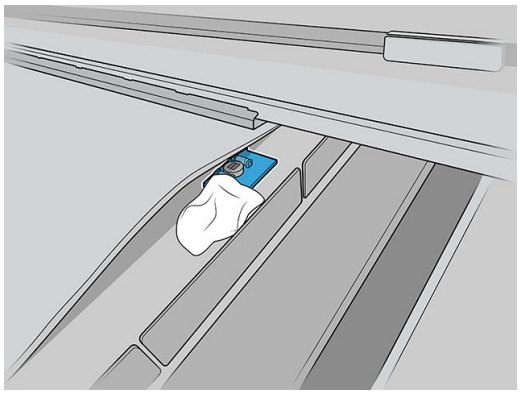


5. Find the substrate-advance sensor under the edge of the belt, beside the carriage.



6. Clean the area around the sensor thoroughly with a clean cloth dampened with a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.

   Also clean the wheels beside the substrate-advance sensor.

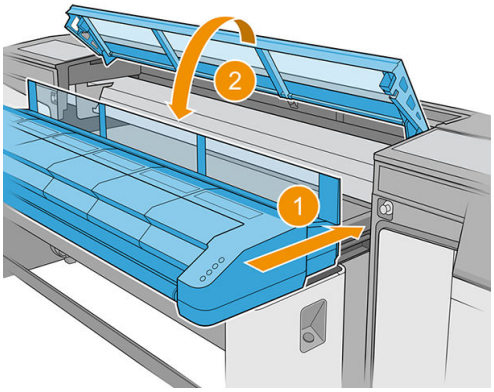


7. Wipe the sensor window with one of the cotton swabs provided in the printer cleaning kit, slightly dampened (not soaked) with distilled water, and if necessary a general-purpose industrial cleaner (such as Simple Green) to remove dried ink. Remove any remaining soap foam with a dry cloth. If the sensor window is heavily coated with dry ink, you may need to apply some pressure while wiping, helping the cotton to absorb the ink.

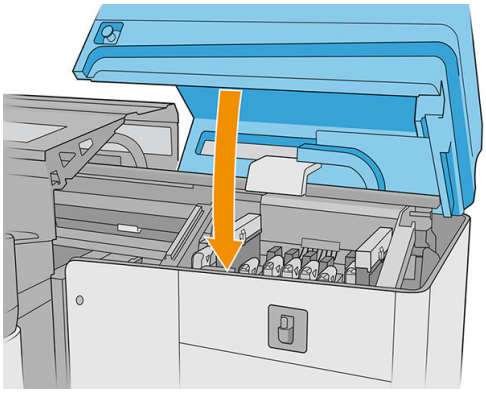
8. Continue cleaning with fresh swabs until the cotton stays clean and the sensor window looks clean.

TIP: When reflecting ambient light, a clean sensor window shows a blue-colored reflection that should extend uniformly across its whole surface. You can see this reflection by moving closer and slightly changing your angle of view.

9. Wait 3 or 4 minutes, so that the cleaner can evaporate completely.
10. Close the curing module (1) and the top cover (2).



11. Close the carriage cover.



12. Run a diagnostic test to check that the sensor is now working correctly.

Replace a curing PCA fan filter

Risk of burns

Crush hazard

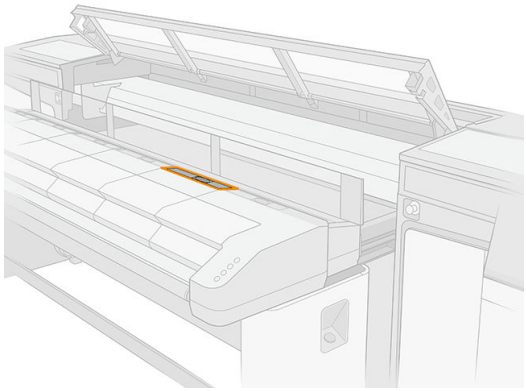
Risk of trapped fingers

Hazardous moving part

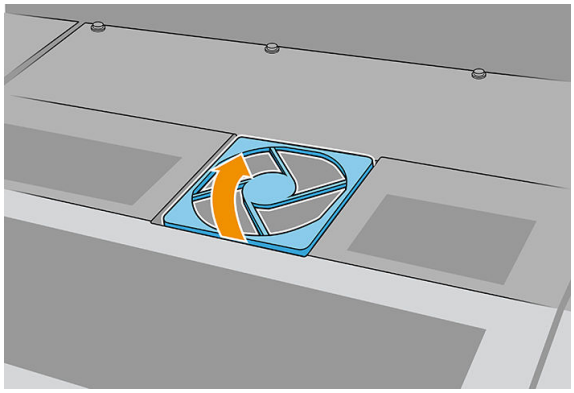
Electric shock hazard

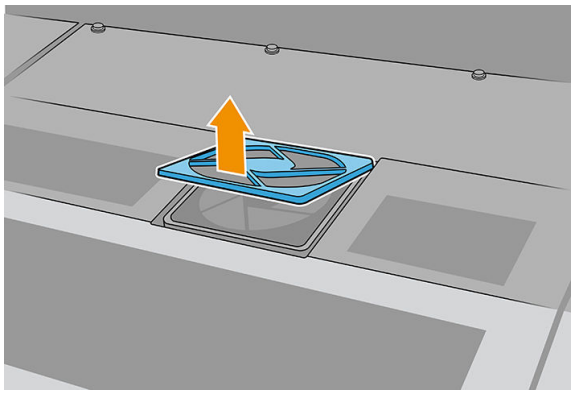
For more safety information, see Safety precautions on page 3

1. Locate the curing PCA fan filter to be replaced.

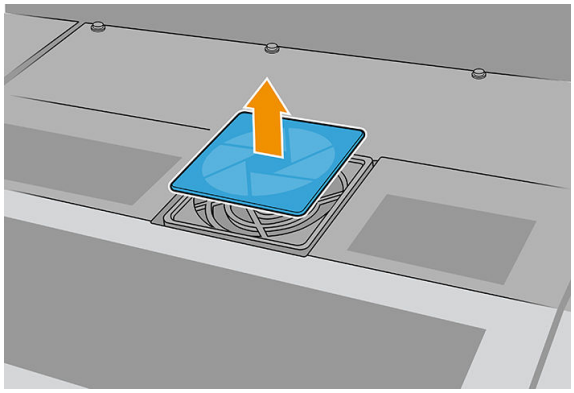


2. Remove the cover.

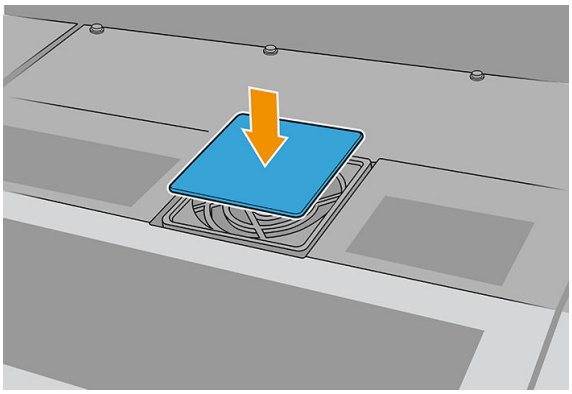




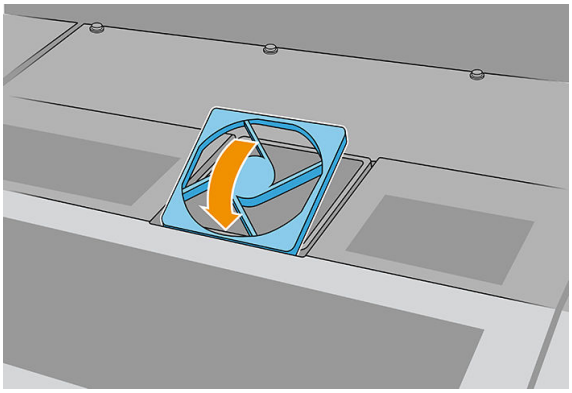
3. Remove the filter.

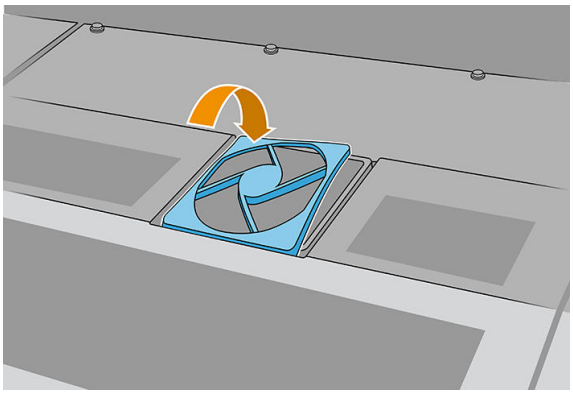


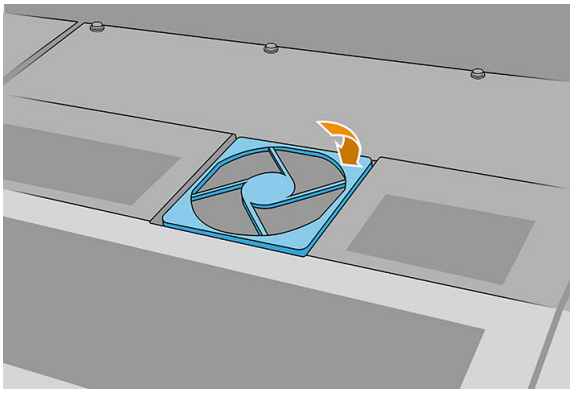
4. Replace the filter with a new one.



5. Reinstall the cover. First fit the points shown in the illustration; then bend the opposite corner.







Clean the power-box fan filter

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

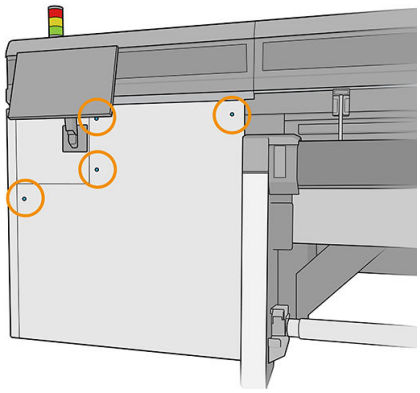
Electric shock hazard

For more safety information, see Safety precautions on page 3

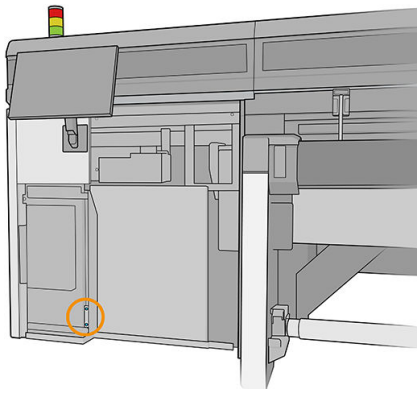
1. Ensure that the printer is not printing.
2. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

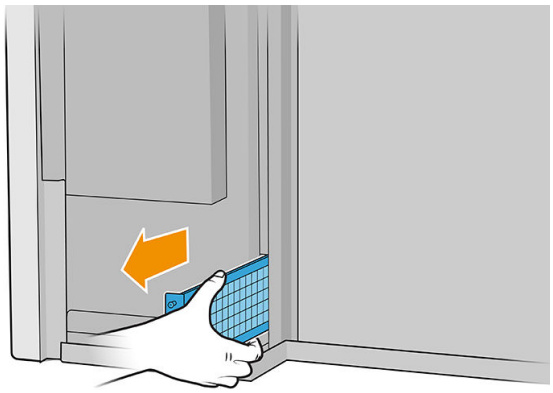
3. Remove the left cover on the input side of the printer.



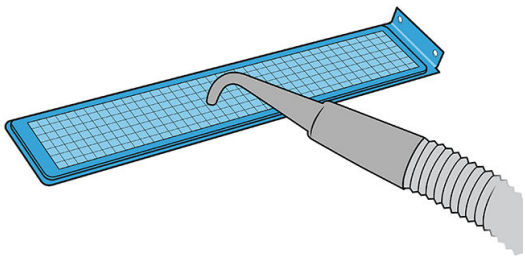
4. Loosen the two screws that attach the power-box fan filter.

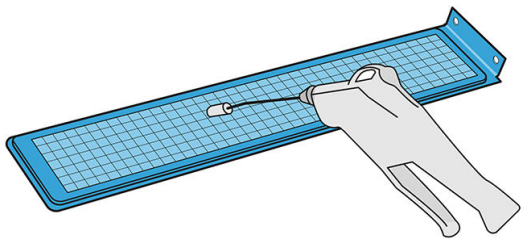


5. Pull out the power-box fan filter.



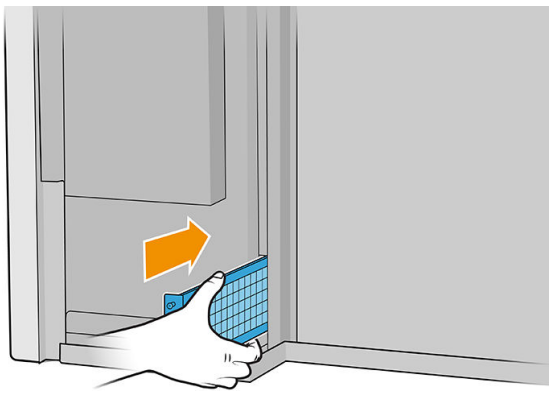
6. Clean the filter with a vacuum cleaner or air gun.

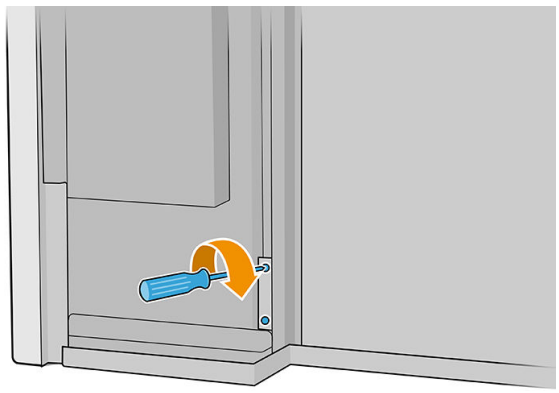




⚠ WARNING! The air gun provided with the printer is intended only to inflate the spindle. If you use it for cleaning purposes, make sure to do so according to local regulations, as additional safety provisions may apply.

7. Reinstall the filter and tighten the screws.





8. Put back the left cover.
9. Turn on the printer.
10. Wait until the rearm button blinks, then press the rearm button.
11. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

12. Tap **Next** to finish this maintenance operation.

Clean a curing PCA fan filter

Risk of burns

Crush hazard

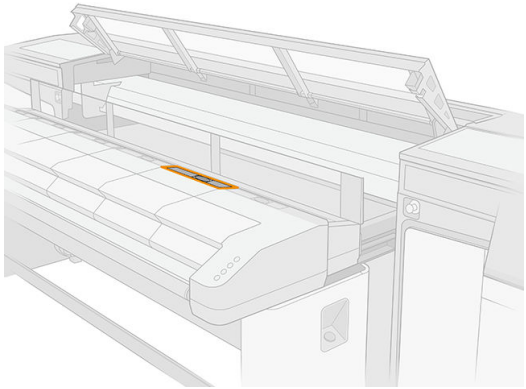
Risk of trapped fingers

Hazardous moving part

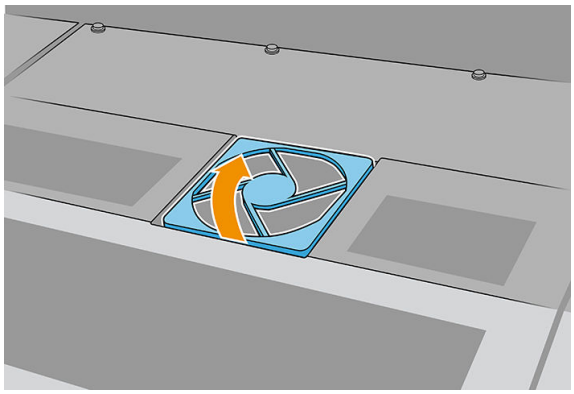
Electric shock hazard

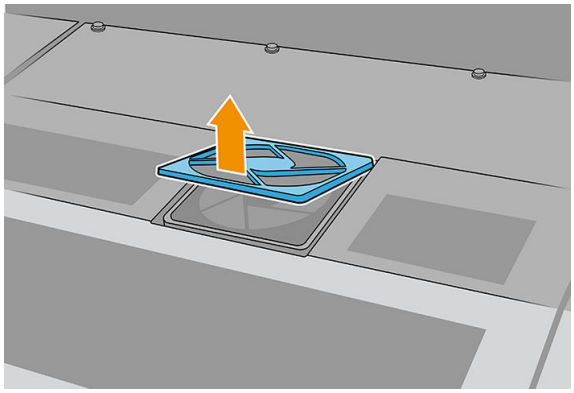
For more safety information, see Safety precautions on page 3

1. Locate the curing PCA fan filter to be cleaned.

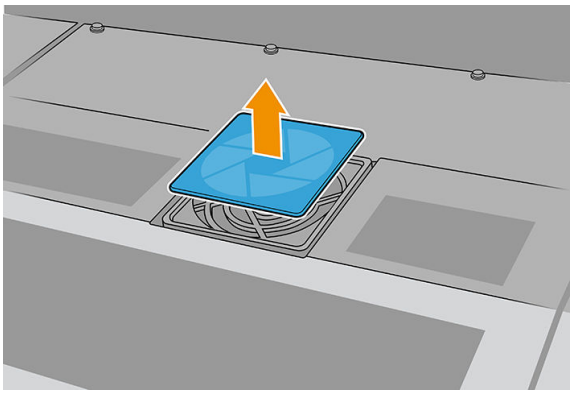


2. Remove the cover.



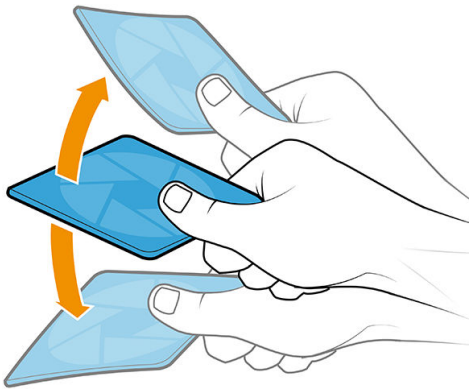


3. Remove the filter.



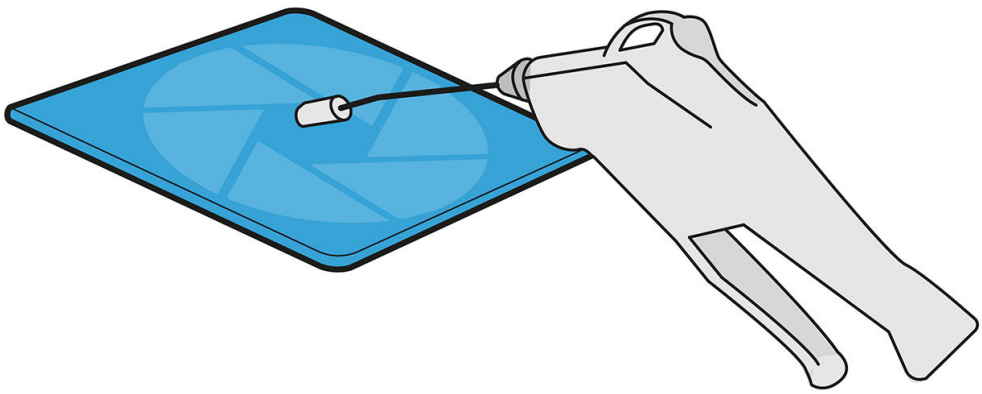
4. Clean the filter with a lint-free cloth.

   You can also shake it, or strike it against a hard surface.

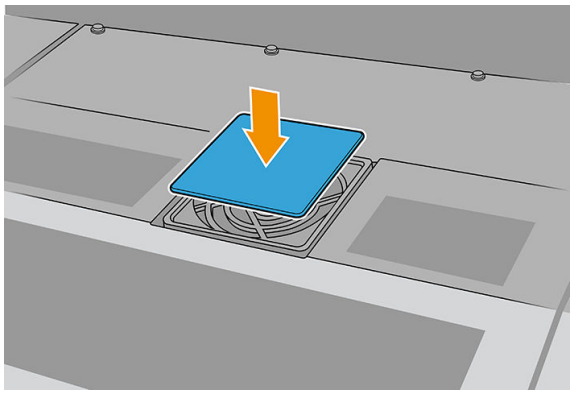


   You can use an air gun if you have one.

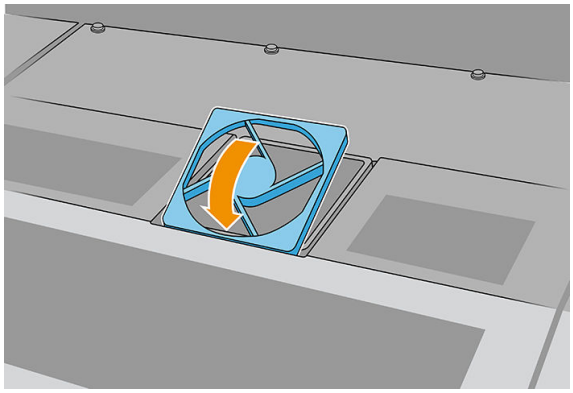
⚠ CAUTION: The air gun provided with the printer is intended only to inflate the spindle. If you use it for cleaning purposes, make sure to do so according to local regulations, as additional safety provisions may apply.

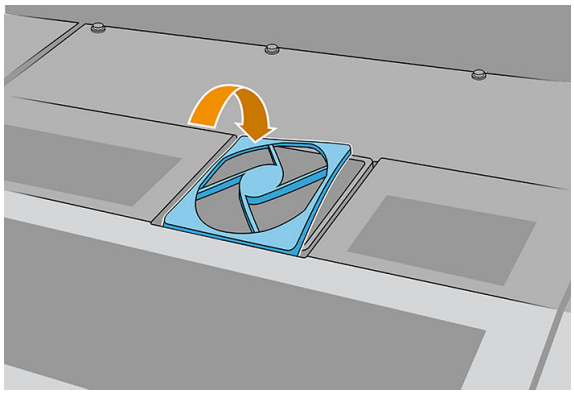


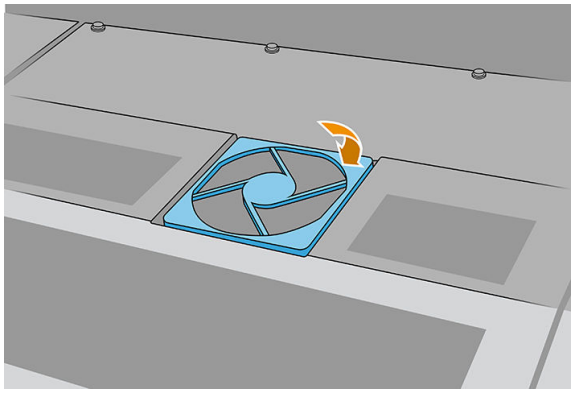
5. Put the cleaned filter back into place.



6. Reinstall the cover. First fit the points shown in the illustration; then bend the opposite corner.







Clean the e-box fan filter

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

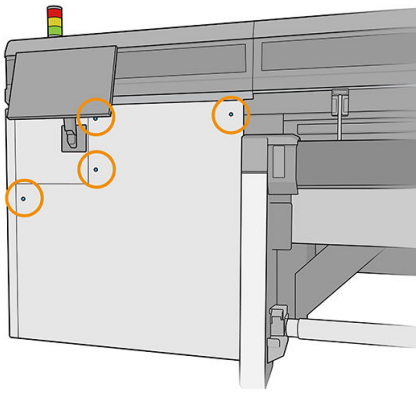
Moving fan blades

For more safety information, see Safety precautions on page 3

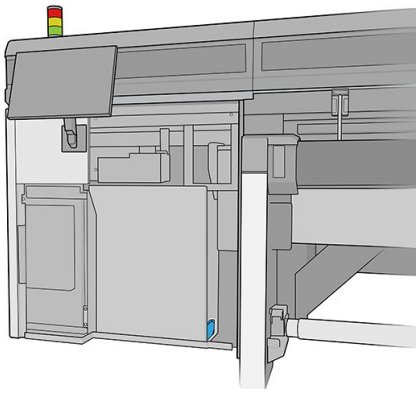
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

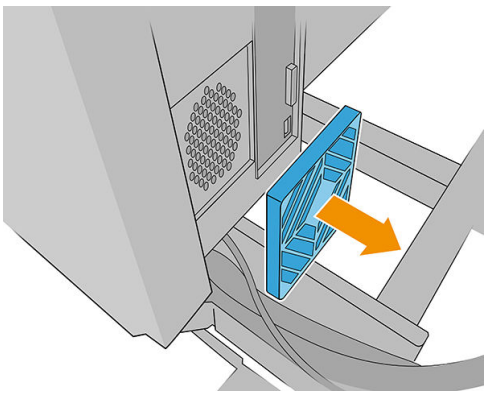
2. Locate the rear right panel assembly.
3. Remove the rear right panel assembly.

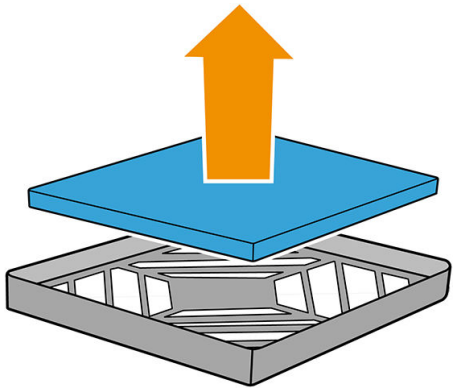


4. Locate the e-box fan filter at the bottom of the e-box.

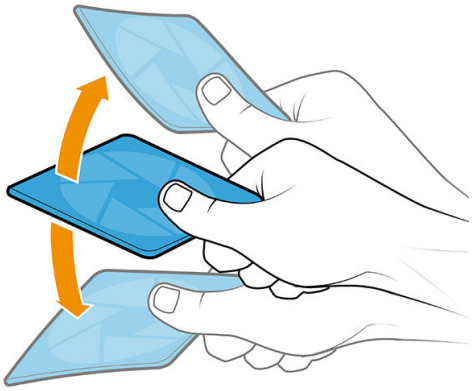


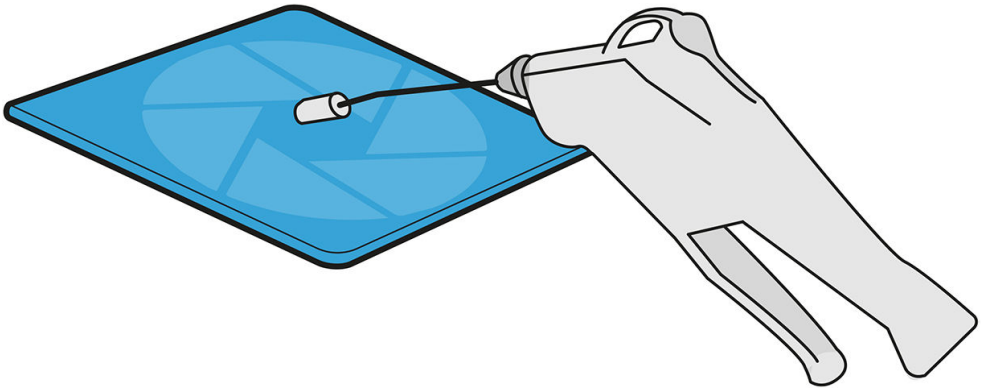
5. Remove the filter from the e-box and from its frame.





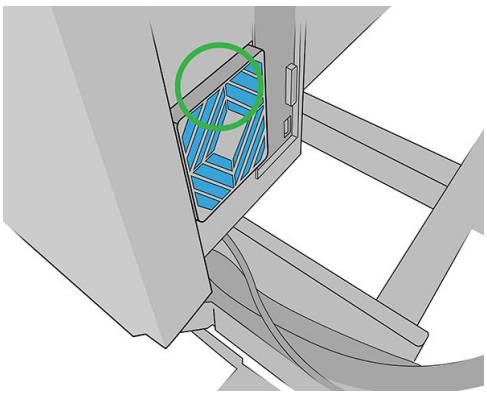
6. Take the fan filter, shake it, and clean it by blowing it with the air gun. Be careful to put it back correctly: it must cover the fan's square surface.

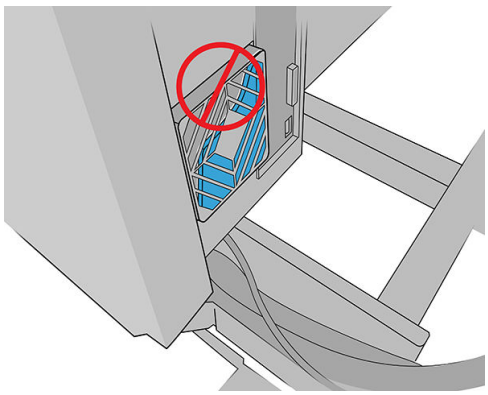




⚠ WARNING! The air gun provided with the printer is intended only to inflate the spindle. If you use it for cleaning purposes, make sure to do so according to local regulations, as additional safety provisions may apply.

7. Put the filter back into its frame, and the frame back into the e-box.





8. Put back the rear right panel assembly and its screws.
9. Turn on the printer.
10. Wait until the rearm button blinks, then press the rearm button.
11. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

12. Tap **Next** to finish this maintenance operation.

When required

Before any cleaning maintenance, ensure that the printer is not printing, the substrate is unloaded, and all the covers and windows are closed and in their correct positions. Be careful to follow the appropriate safety precautions.

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

Apart from the periodic cycle and ink consumption based maintenance procedures, there are other maintenance tasks that have to be carried out when required:

- Clean the printhead contacts
- Replace a spindle valve
- Replace the curing fan and resistor module
- Replace the spectrophotometer shutter
- Grease the printhead primers
- Replace the left printhead cleaning blade
- Empty the printhead cleaning waste bottle
- Replace the left spittoon foam
- Replace an intermediate tank
- Replace the e-box fan filter
- Replace the power-box fan filter
- Replace an alignment-bar wheel
- Replace the right printhead cleaning blades
- Replace the scan-axis bumps
- Replace the aerosol fan module
- Replace the crash sensor legs
- Replace the alignment bar
- Replace the print-zone lights
- Replace the printhead cleaning waste bottle
- Replace the plastic needles in the auxiliary printhead storage box
- Replace the auxiliary printhead

Clean the printhead contacts

WARNING! This operation is limited to trained personnel only!

NOTE: During the installation of the printer, the designated personnel received training for safe operation and maintenance of the printer. It is not allowed to use the printer without this training.

WARNING! Read and follow the safety precautions section to make sure you use the equipment safely: see Safety precautions on page 3. You are expected to have the appropriate technical training and experience necessary to be aware of hazards to which you may be exposed in performing a task, and to take appropriate measures to minimize the risks to yourself and to others.

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

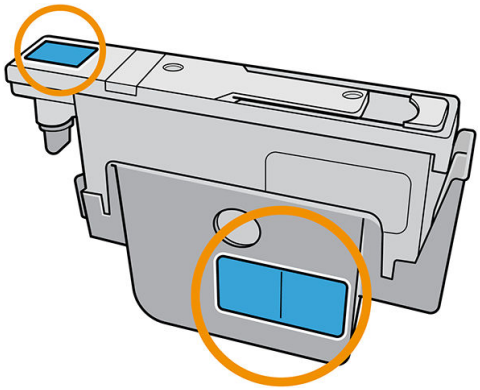
For more safety information, see Safety precautions on page 3

Clean the printhead contacts in the carriage slot

1. Ensure that you have the printer cleaning kit, which is provided with your printer.
2. Identify which printheads need cleaning, usually after the Internal Print Server recommends replacing or reseating them.
3. Open the carriage cover.
4. Turn off the printer in the correct way for maintenance operations: see Turn the printer off on page 139.

5. Carefully remove the printheads that may need cleaning from the carriage and protect them using their orange sealing caps.

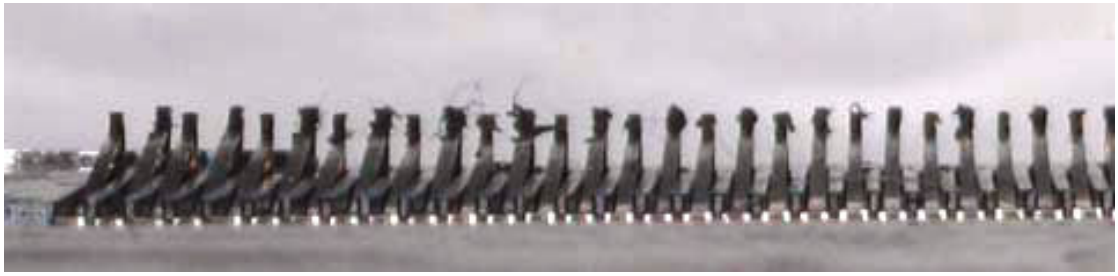
CAUTION: **Ensure that each printhead uses its own color cap.** This is especially important with the Optimizer printhead caps as there is a high risk of nozzle damage if they are used with the color printheads and vice-versa. The optimizer caps are labeled as shown below.



TIP: Remember which printhead came from which slot; the printer will report an error if you later replace a printhead in the wrong slot.

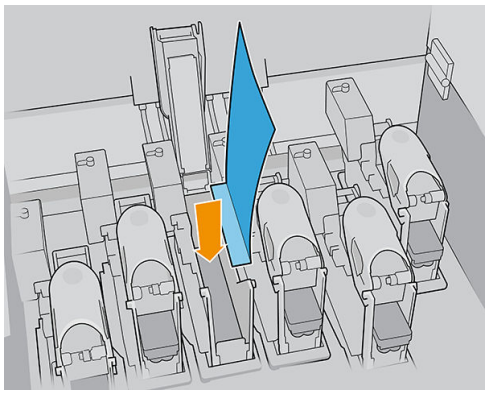
6. Illuminate the printhead slot in the carriage and check the electrical contacts for dirt.

TIP: Placing some white paper behind the contacts will improve contrast and may help you to check for dirt.

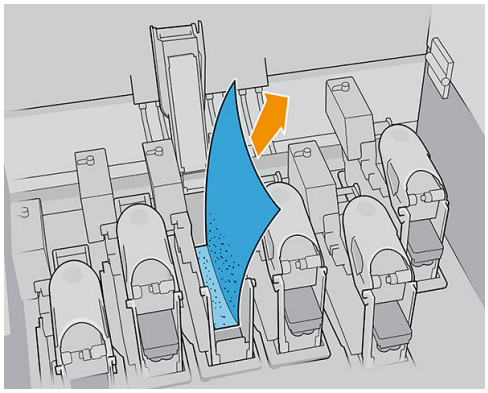


7. Clean the dirty contacts gently but thoroughly using a lint-free cloth. A piece of paper or cloth can be used to collect the dirt.

CAUTION: Clean the contacts with a vertical movement and very carefully, otherwise they may be damaged.



8. Remove the piece of paper or cloth to prevent the dirt from spreading.

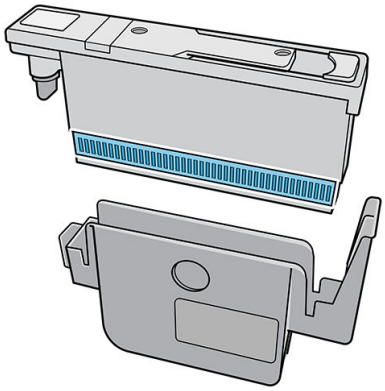


9. Illuminate the printhead slot again to check that the electrical connections are now clean and undamaged.

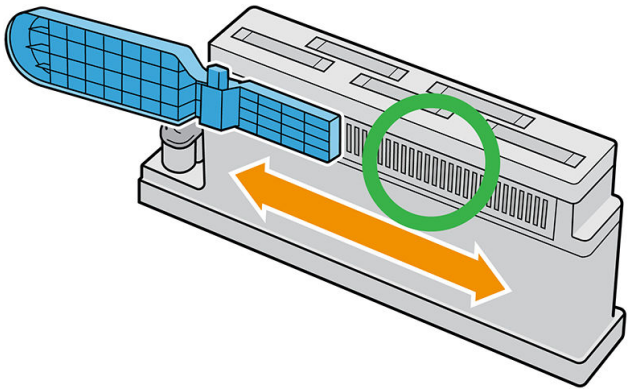
Clean the printhead contacts on the printhead

1. Use a lint-free cloth to clean the electrical contacts carefully.
2. Attention: Use only vertical movements, because the contacts can be damaged if cleaned in other directions.
3. Take special care to clean the bottom part of the printhead pocket

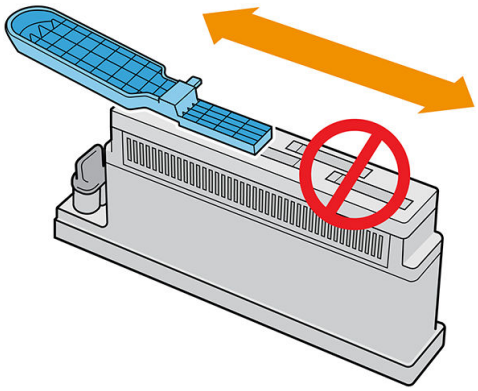
4. Remove the printhead cap and locate the contacts.



5. Clean the contacts.



⚠ CAUTION: Do **not** use the printhead interconnect wiper to clean the nozzles!



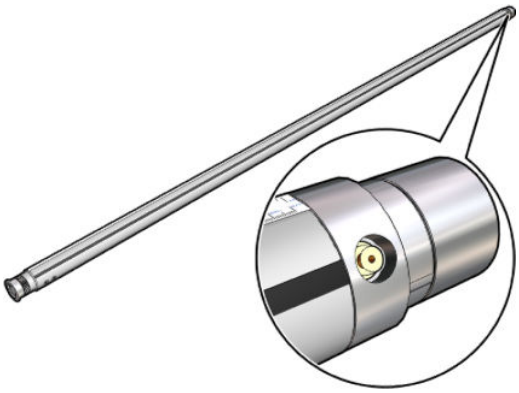
6. Wait until the contacts are dry.
7. Put back the printheads, each in the same slot from which it came.
8. Close the carriage cover.
9. Turn on the printer in the correct way for maintenance operations: see Turn the printer on on page 139.

Replace a spindle valve

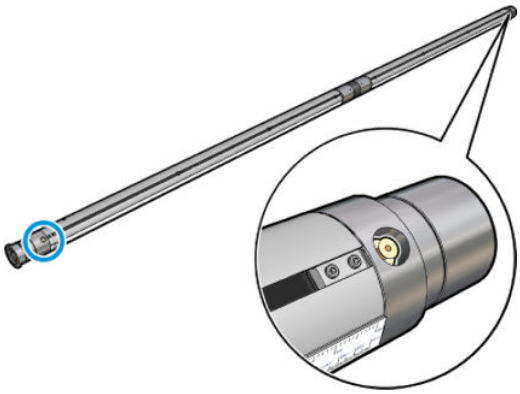
Risk of trapped fingers

For more safety information, see Safety precautions on page 3

1. Ensure that you have the spindle air valve, which is included in the basic uptime kit.
2. Ensure that you have an 11 mm (7/16 inch) tube wrench key and the pneumatic gun.
3. Press the valve to deflate the spindle.
4. Remove the spindle valve with the tube wrench key.



NOTE: Remember that the dual-roll spindle has two valves; identify the one that needs replacement.



5. Insert the new valve and tighten it. The valve must be well seated in position and firm, but do not force it with the key.
6. Test the new valve by inflating and deflating the spindle.

Replace the curing fan and resistor module

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

Moving fan blades

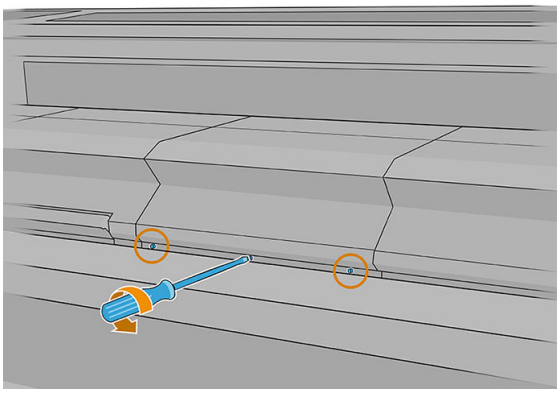
For more safety information, see Safety precautions on page 3

The Internal Print Server will tell you which module needs to be replaced.

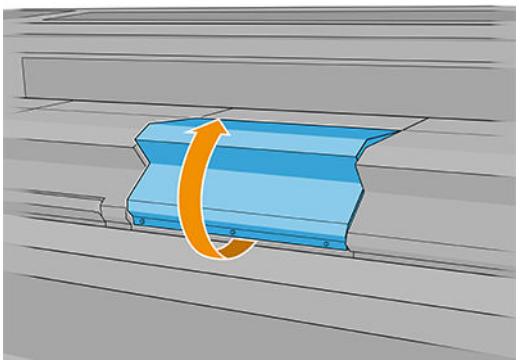
Removal

1. Turn off the printer and the power-enable switch.

2. Move the output roller down.
3. Use a long flat-end screwdriver to remove the screws from the curing module.

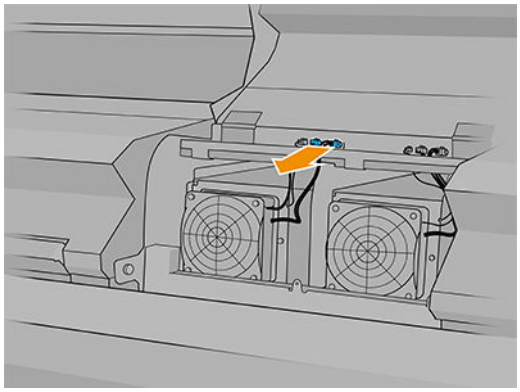


4. Lift the module cover to reach the interior.

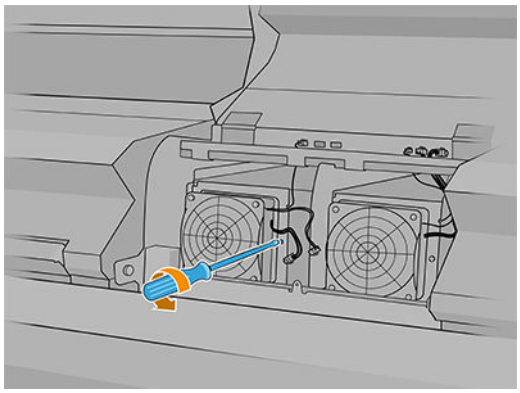


5. Disconnect the two cables shown below. You have to press the retention clip on each of the two connectors, and gently pull the cable.

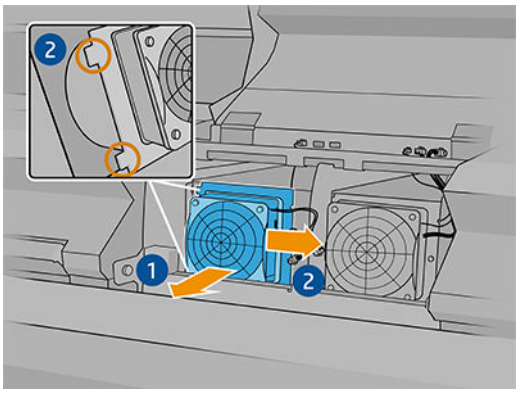
NOTE: You will see three cables. The one on the left is the temperature sensor cable, which does not need to be disconnected.

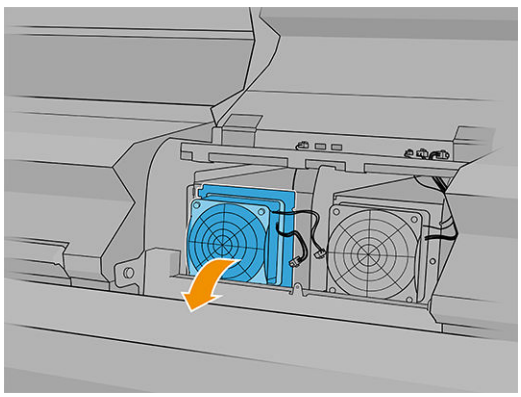


6. Use a screwdriver to remove the screws of the fan/resistor module.



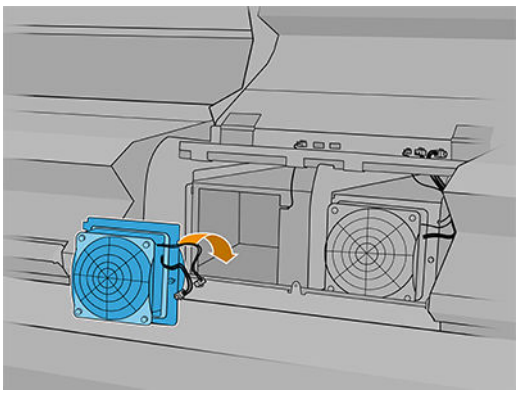
7. Remove the fan/resistor module.

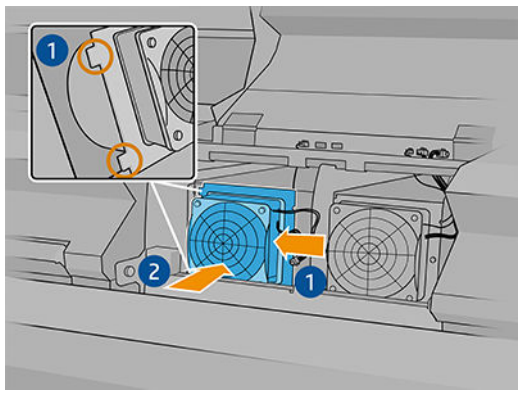




Installation

1. Put the new fan/resistor module into position. Insert and tighten the screw, and connect the two cables to each fan/resistor module.





2. Close the curing module and make sure the pins are in the correct position; then secure them.
3. Close the module cover.
4. Use a screwdriver to secure the module cover.
5. Turn on the printer.

Replace the spectrophotometer shutter

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

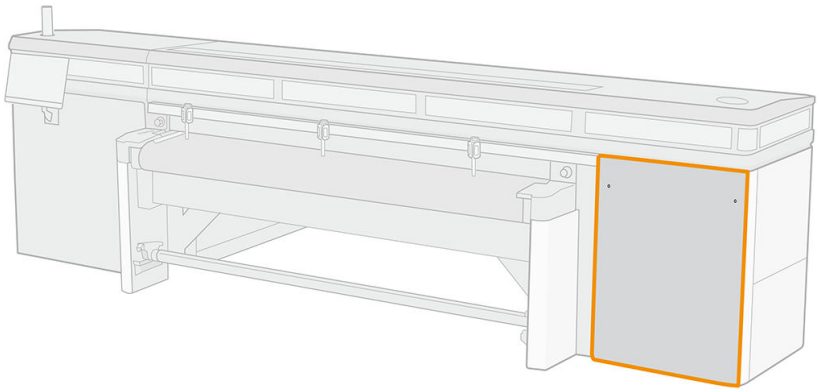
For more safety information, see Safety precautions on page 3

Removal

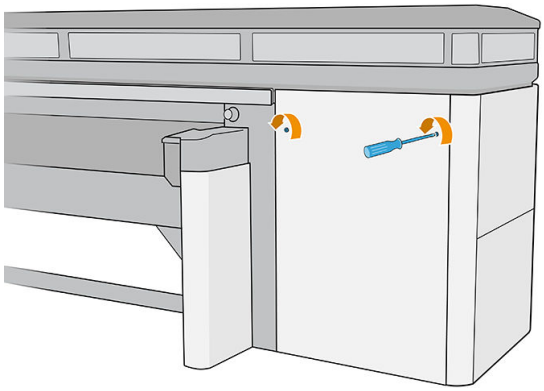
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

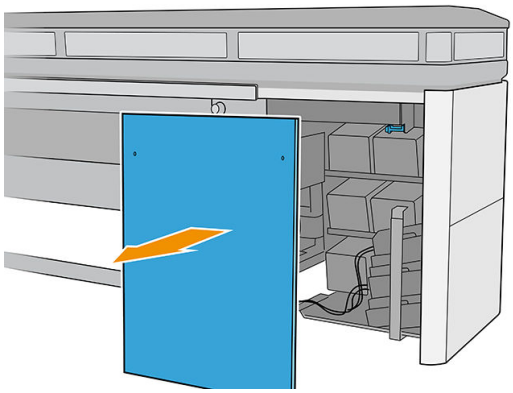
2. Locate the ink-delivery-system cover on the right of the input side of the printer.



3. Remove two screws from the cover.

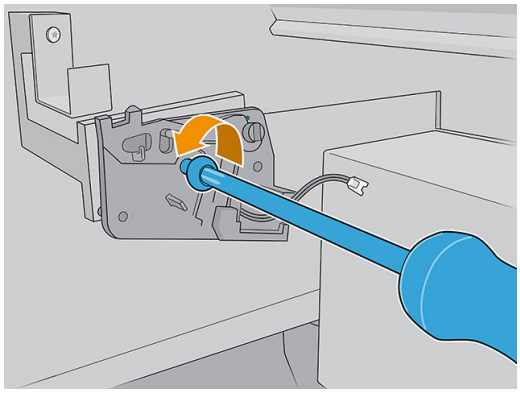


4. Remove the cover.

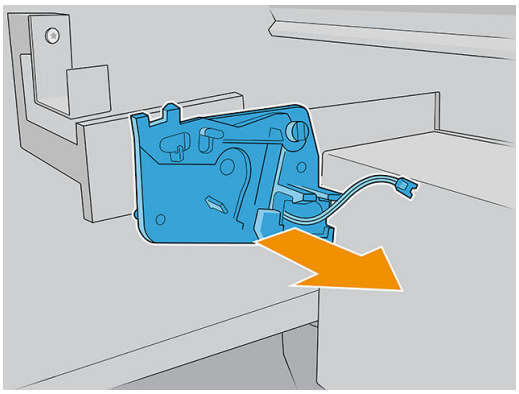


5. Unplug the spectrophotometer power cable.

6. Remove the screw that attaches the spectrophotometer shutter.

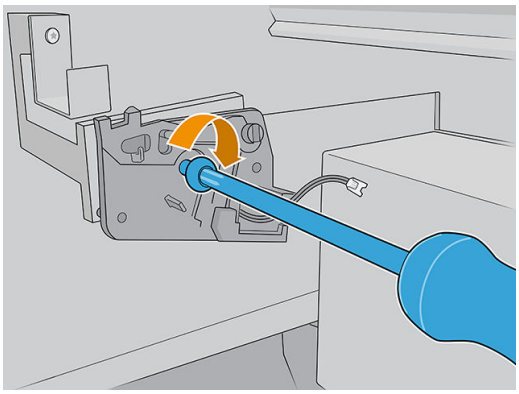


7. Remove the spectrophotometer shutter.



Installation

1. Remove the new spectrophotometer shutter from its package.
2. Install the new spectrophotometer shutter and attach it with the same screw that you removed earlier.



3. Plug the spectrophotometer power cable back into the printer.
4. Reinstall the cover.
5. Make sure all doors and covers on the printer are closed.
6. Turn on the printer.
7. Wait until the rearm button blinks, then press the rearm button.
8. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

9. Tap **Next** to finish this maintenance operation.

Grease the printhead primers

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

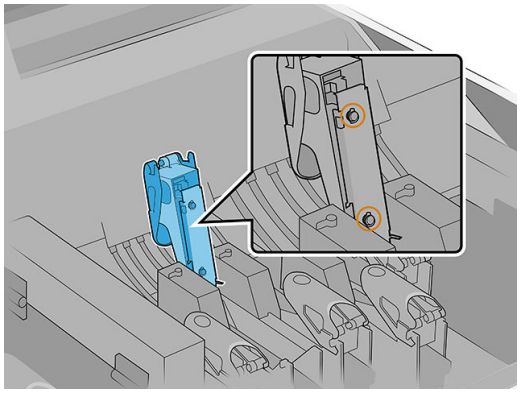
For more safety information, see Safety precautions on page 3

NOTE: Perform this procedure when the system error Y088-0001-0X41 appears.

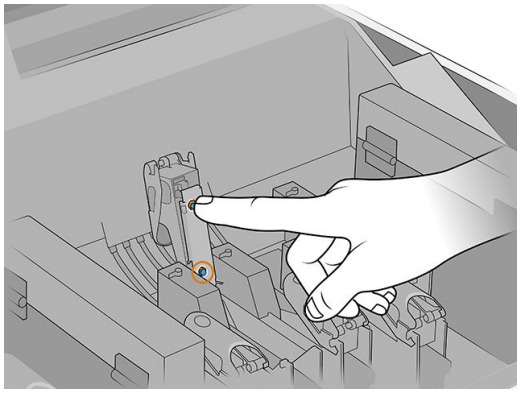
1. Turn off the printer in the correct way for maintenance operations: see Turn the printer off on page 139.

2. Open the carriage cover.

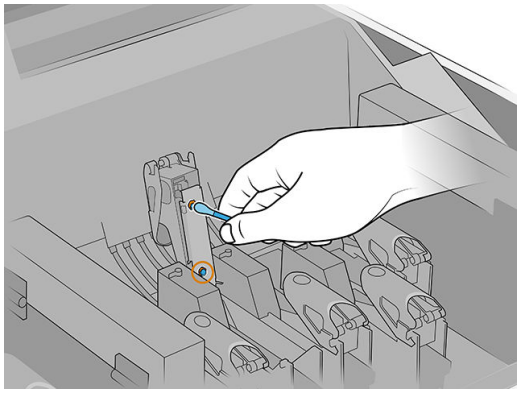
3. After lifting the printhead covers, two 'O' rings can be seen that seal the joints between the printhead cover and printhead.



4. With a finger, apply a little grease to the 'O' rings to improve their performance. A suitable grease is available in a syringe from the printer maintenance kit.



The grease should be applied to the black rubber part only. If grease gets into the central hole, remove it with a toothpick or similar tool.



5. Close the printhead cover, the carriage cover, and the printhead access door.

Replace the left printhead cleaning blade

Risk of burns

Crush hazard

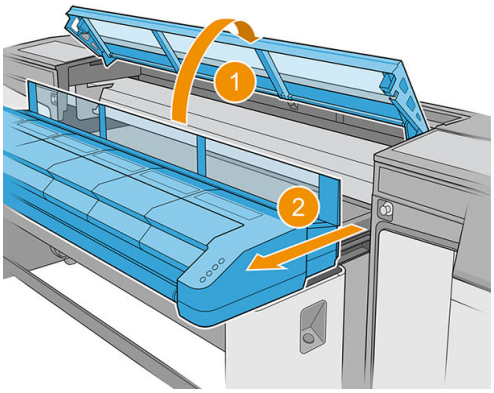
Risk of trapped fingers

Hazardous moving part

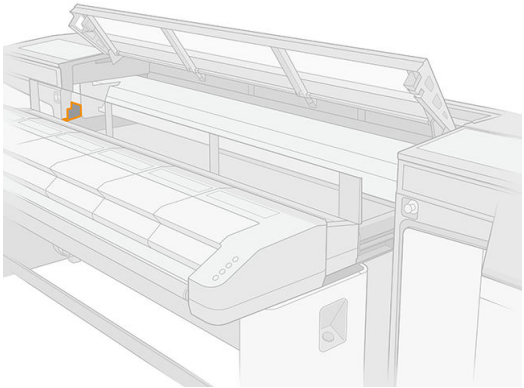
Electric shock hazard

For more safety information, see Safety precautions on page 3

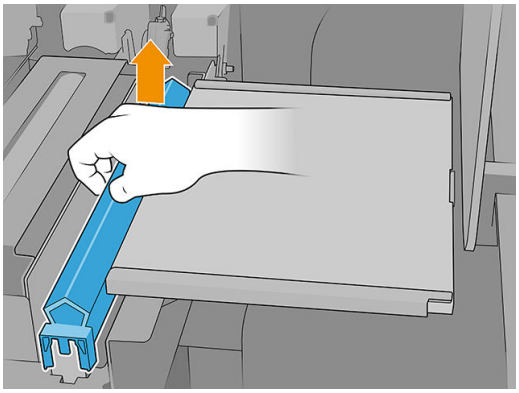
1. Open the top cover (1) and the curing module (2).



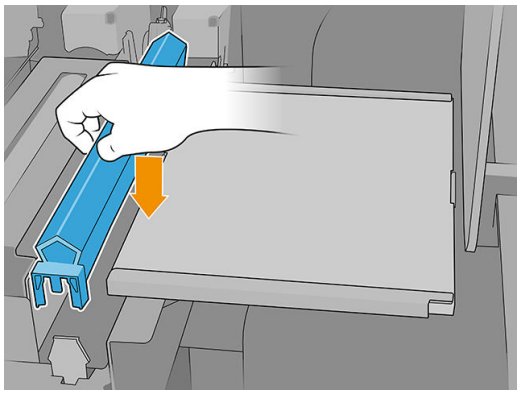
2. Locate the left printhead cleaning blade at the left side of the print area, beside the left spittoon.



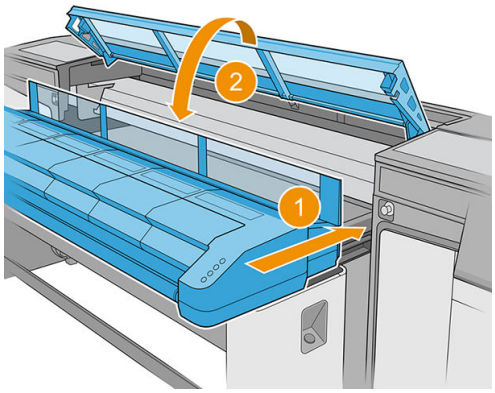
3. Grip the rubber blade in the center and pull it out.



4. Insert the new blade.



5. Close the curing module (1) and the top cover (2).



6. Calibrate the left printhead cleaning blade.

Empty the printhead cleaning waste bottle

Risk of burns

Crush hazard

Risk of trapped fingers

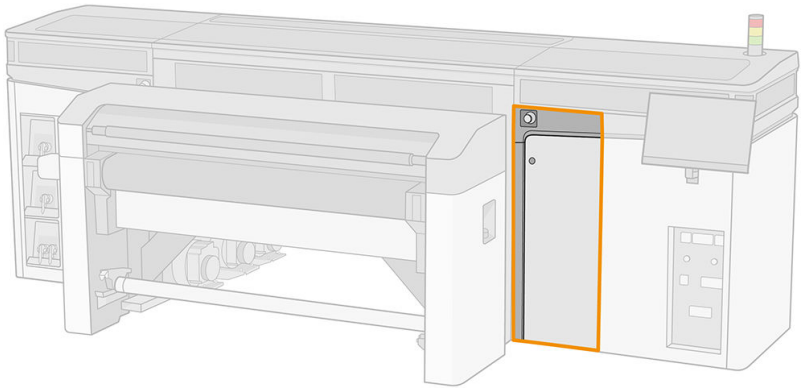
Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

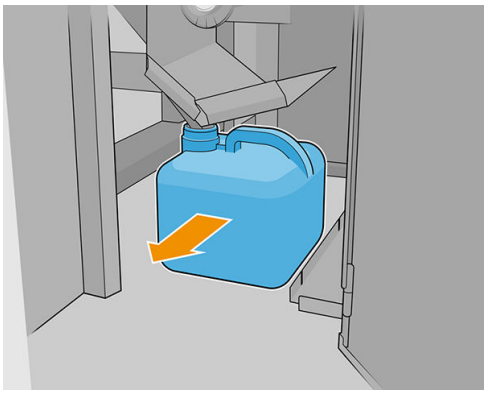
1. Ensure that the printer is not printing.

2. Unlock and open the printhead cleaning roll door.



3. Remove the waste bottle.

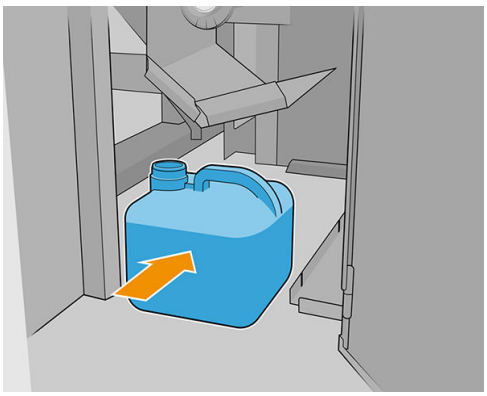
TIP: You are recommended to wear gloves for this operation.



4. Empty the waste bottle.

NOTE: The bottle contains a mixture of ink additives and water. Dispose of this mixture according to local regulations. You can find the Safety Data Sheets (SDS) for the ink at http://www.hp.com/go/msds.

5. Put the emptied bottle back in place. Take care that the mouth of the bottle is well positioned to receive the liquid falling from above.



6. Close the printhead cleaning roll door.

Replace the left spittoon foam

See Replace the left spittoon foam on page 100.

Replace an intermediate tank

See Check and replace an intermediate tank on page 175.

Replace the e-box fan filter

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

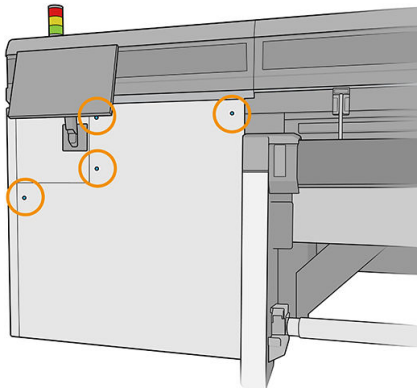
Moving fan blades

For more safety information, see Safety precautions on page 3

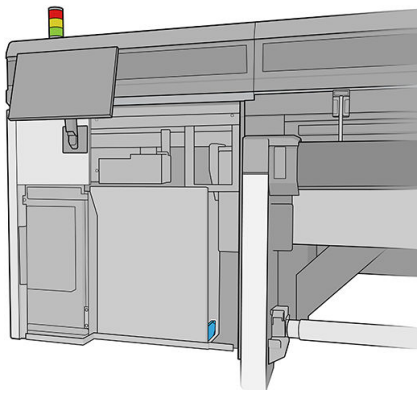
1. Ensure that you have a new e-box fan filter, provided in the printer maintenance kit.
2. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

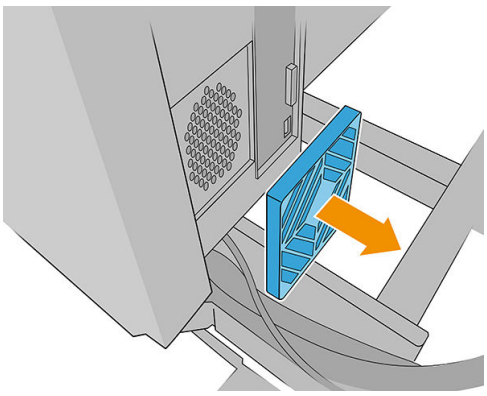
3. Locate the rear right panel assembly.
4. Remove the rear right panel assembly.

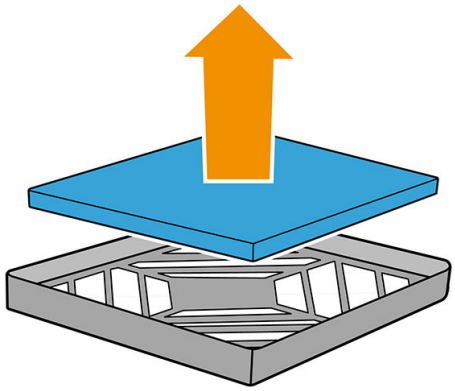


5. Locate the e-box fan filter at the bottom of the e-box.

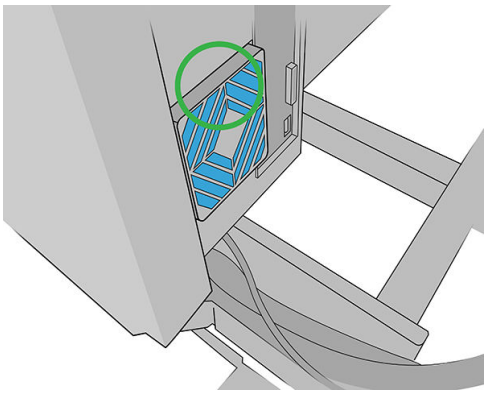


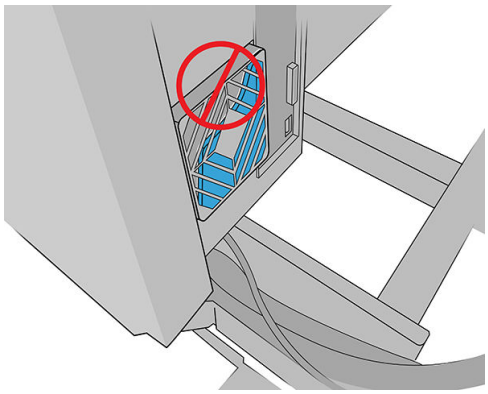
6. Remove the filter from the e-box and from its frame.





7. Change the fan filter for the new one provided. Be careful to position it correctly: it must cover the fan's square surface.
8. Put the filter back into its frame, and the frame back into the e-box.





9. Put back the rear right panel assembly and its screws.
10. Turn on the printer.
11. Wait until the rearm button blinks, then press the rearm button.
12. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

13. Tap **Next** to finish this maintenance operation.

Replace the power-box fan filter

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

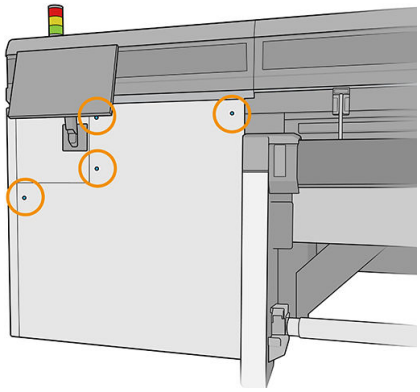
Electric shock hazard

For more safety information, see Safety precautions on page 3

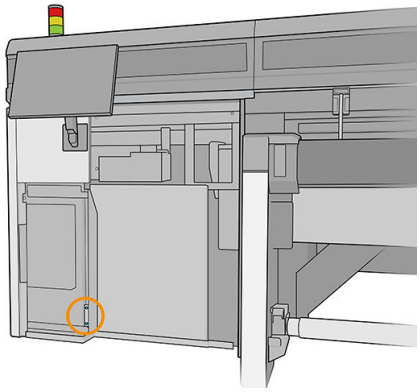
1. Ensure that the printer is not printing.
2. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

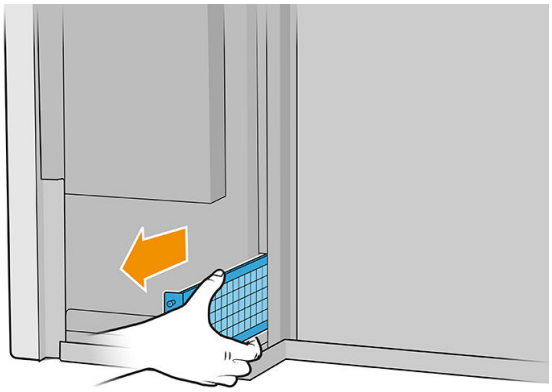
3. Remove the left cover on the input side of the printer.



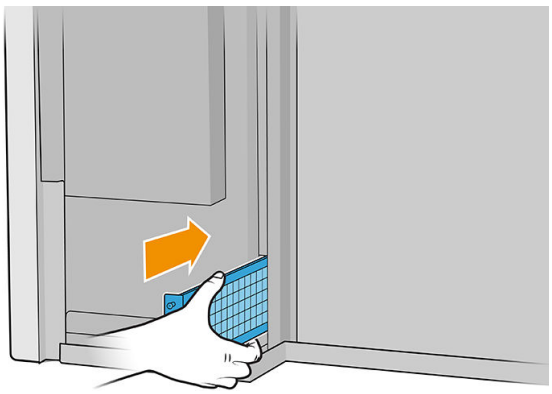
4. Loosen the two screws that attach the power-box fan filter.

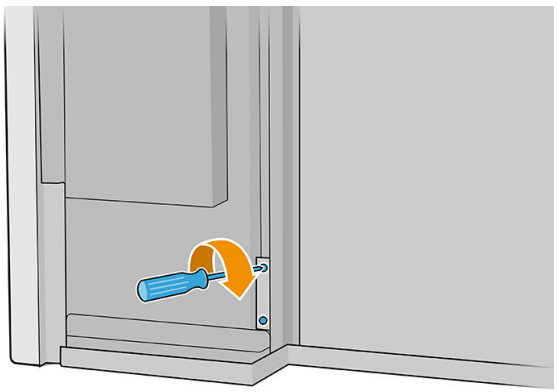


5. Pull out the power-box fan filter.



6. Install the new power-box fan filter and tighten the screws.





7. Put back the left cover.
8. Turn on the printer.
9. Wait until the rearm button blinks, then press the rearm button.
10. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

11. Tap **Next** to finish this maintenance operation.

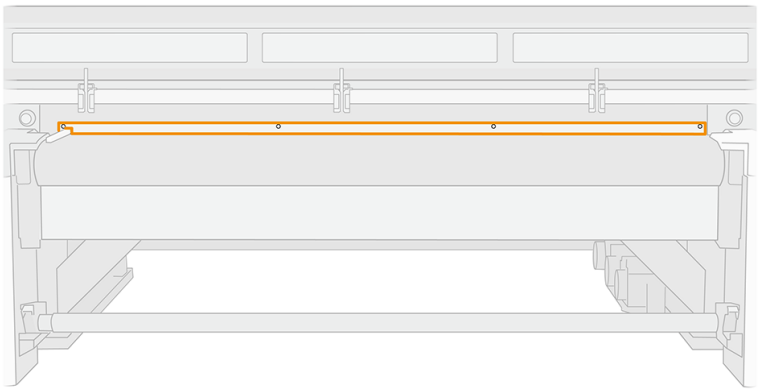
Replace an alignment-bar wheel

http://www.hp.com/go/latexRseries/replace_alignment_wheels

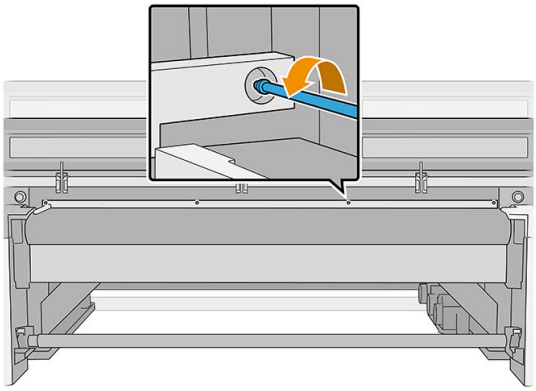
1. Ensure that the printer is not printing.
2. Move the the front alignment bar to the service position.
3. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

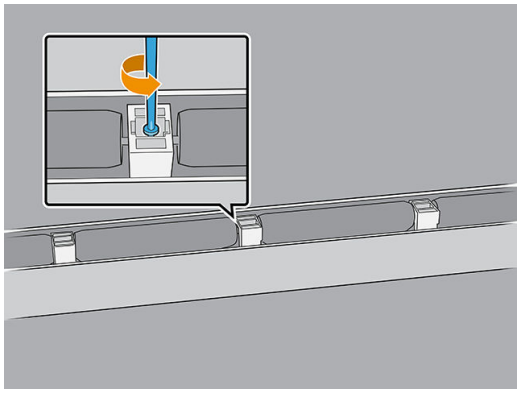
4. Move the carriage carefully to the right until it stops.
5. Locate the alignment bar in the substrate path on the input side of the printer.



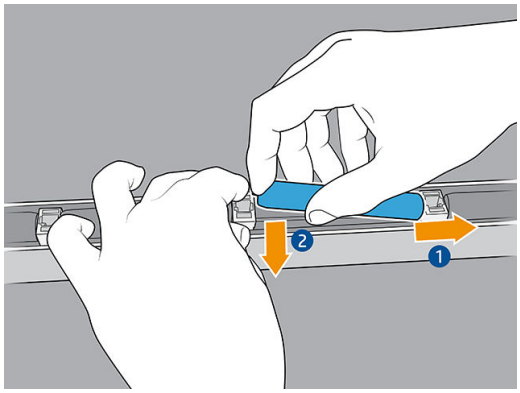
6. Unscrew and remove the front alignment bar. Five screws have to be removed.



7. Position the alignment bar on a table or other flat surface, and locate the wheel that needs to be replaced.
8. Release the wheel by removing the screw that attaches it.



9. Remove the wheel.
10. Position the new wheel as shown below and attach it with the screw.



NOTE: The wheel support holds two wheels, one on each side. Therefore, to install the new wheel properly, you must lift the support slightly in order to position both wheels at the same time.

11. Check that the wheels rotate freely.
12. Reinstall the front alignment bar and attach it with the screws you removed earlier.
13. Turn on the printer.
14. Wait until the rearm button blinks, then press the rearm button.
15. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

16. Calibrate the alignment bar.
17. Tap **Next** to finish this maintenance operation.

Replace the right printhead cleaning blades

See Replace the right printhead cleaning blades on page 162.

Replace the scan-axis bumps

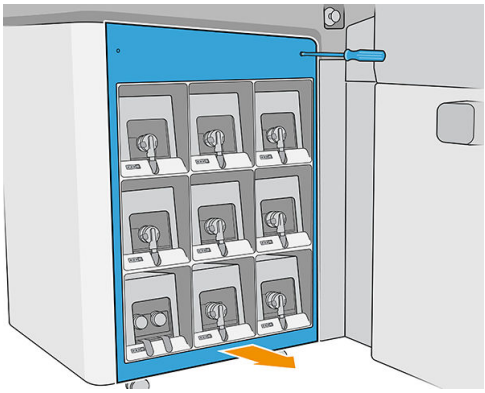
There are two scan-axis bumps, one at each side of the printer.

Ink delivery system side

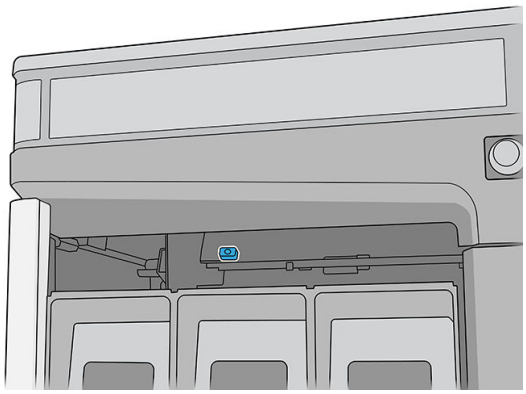
1. Ensure that the printer is not printing.
2. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

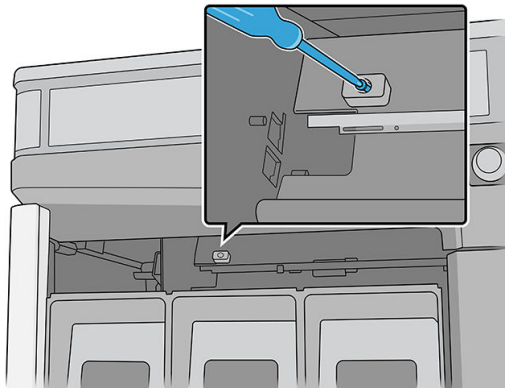
3. Locate the scan-axis bump at the rear of the ink delivery system.
4. Remove the front cover of the ink delivery system.



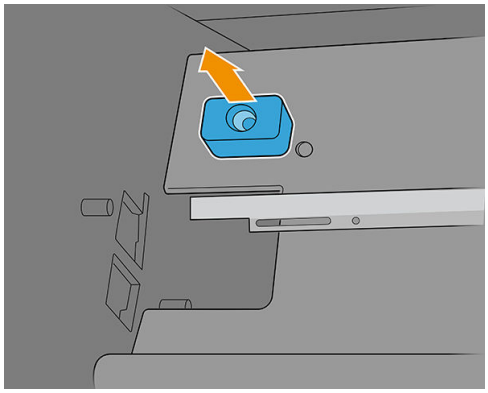
5. Access the scan-axis bump through the gap between the inks and the top cover.



6. Use a T25 screwdriver to remove the screw that attaches the scan-axis bump.



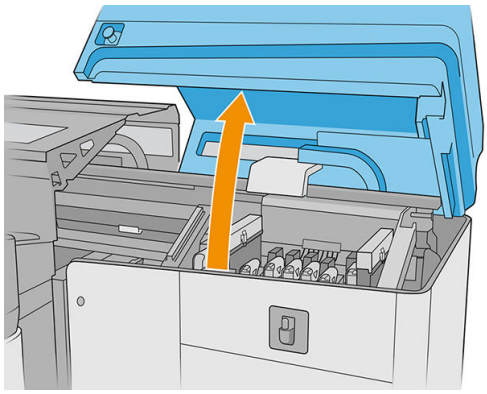
7. Remove the scan-axis bump.



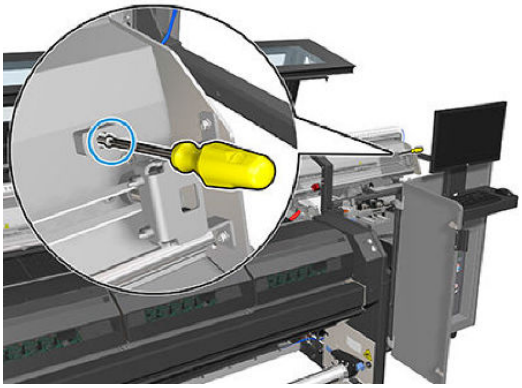
8. Install the new scan-axis bump and attach it with the same screw.
9. Put back the cover.

Service station side

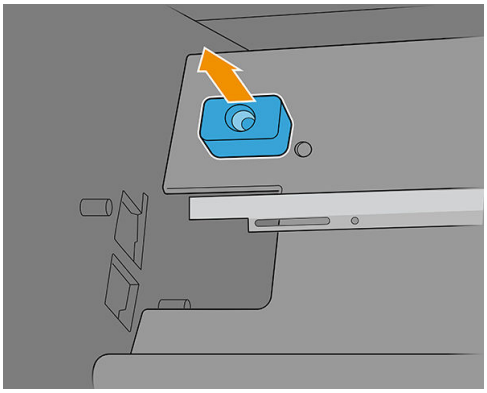
1. Open the carriage cover.



2. Use a T25 screwdriver to remove the screw that attaches the scan-axis bump.



3. Remove the scan-axis bump.



4. Install the new scan-axis bump and attach it with the same screw.
5. Close the carriage cover.
6. Turn on the printer.
7. Wait until the rearm button blinks, then press the rearm button.
8. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

9. Tap **Next** to finish this maintenance operation.

Replace the aerosol fan module

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

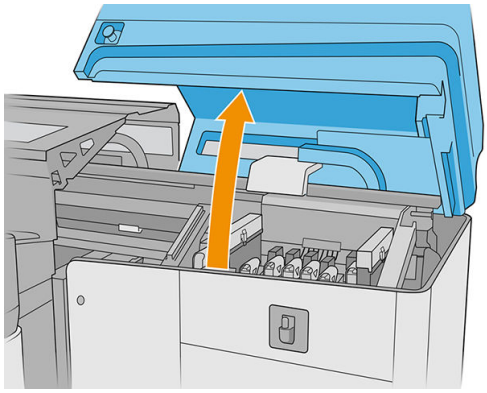
For more safety information, see Safety precautions on page 3

Prepare to replace the aerosol fans module

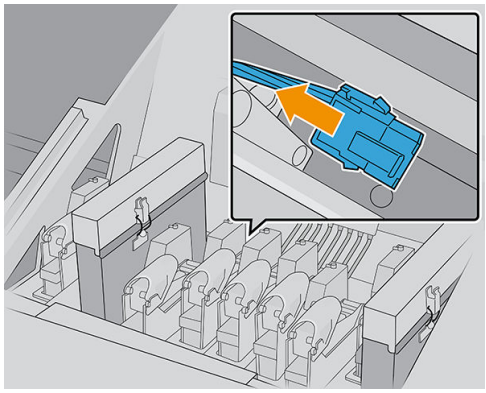
1. Ensure that the printer is not printing.
2. Turn off the printer.

   IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

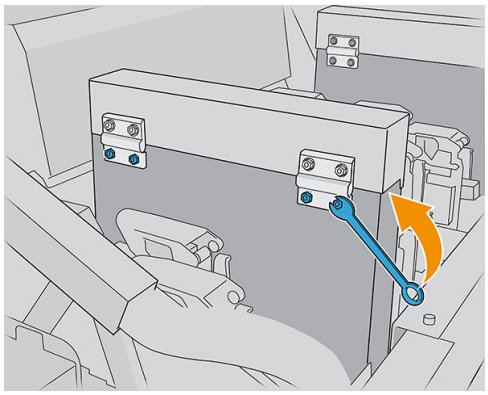
3. Open the carriage cover.



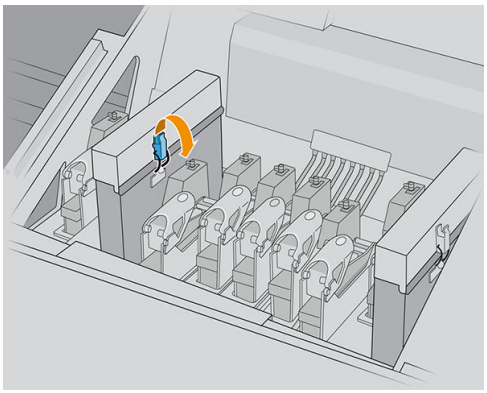
4. Disconnect the two aerosol-fan cable connectors.



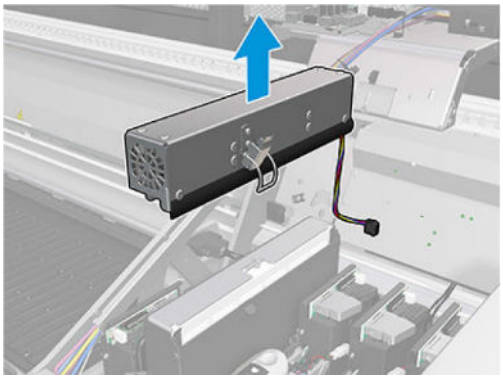
5. Remove the hinges that attach the aerosol lid and the aerosol container by loosening four nuts with a 7 mm wrench. Hold the nuts to prevent them from falling and getting lost inside the carriage.



6. Open the latch.



7. Remove the aerosol fan module and insert the new one.



8. Put the hinges back in place, put back the nuts, and tighten them.
9. Connect the two aerosol fan cable connectors.
10. Turn on the printer.
11. Wait until the rearm button blinks, then press the rearm button.
12. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

13. Tap **Next** to finish this maintenance operation.

Replace the crash sensor legs

Risk of burns

Crush hazard

Risk of trapped fingers

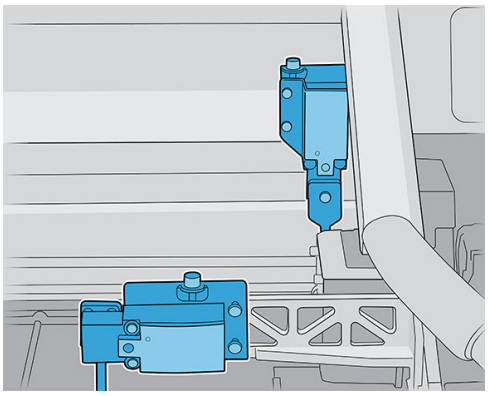
Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

http://www.hp.com/go/latexRseries/replace_crash_sensor_leg

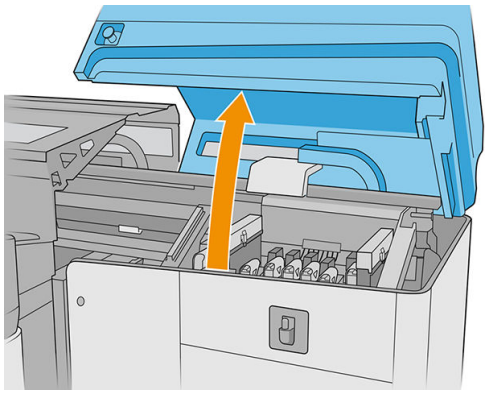
The carriage has two crash sensors, each attached to a leg.



NOTE: Two legs are provided with the kit; be careful to install the correct one.

Replace the front crash sensor leg

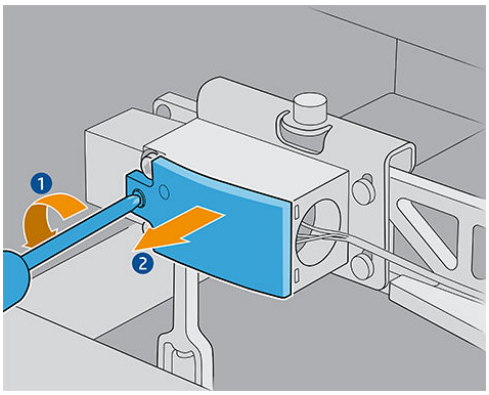
1. Turn off the printer and the power-enable switch.
2. Open the carriage cover.



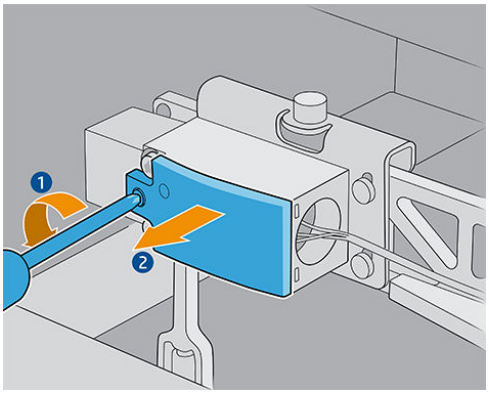
3. Manually move the carriage to the service position (at the far right).

4. Loosen the two screws and remove the metallic part.

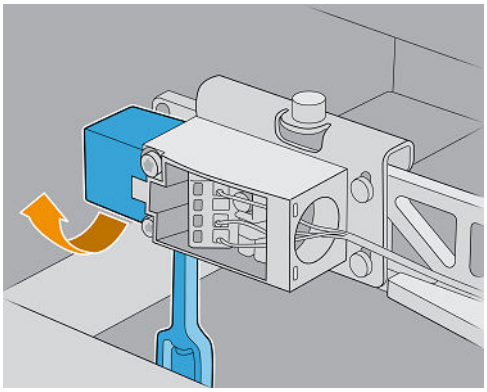
IMPORTANT: Do not remove the screws from the crash sensor cover.



5. Loosen the screw that holds the yellow part, and remove the part and the screw together.



6. Remove the black cover.



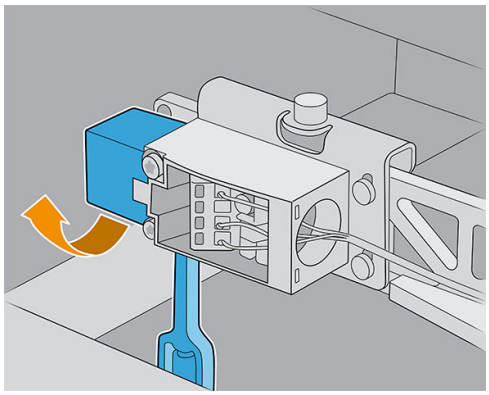
7. Move the carriage slightly to the left, to avoid touching the printhead cleaning roll when removing the leg.
8. Turn the crash sensor leg 45° to the left to remove it.

CAUTION: The leg can be turned in only one direction; do not try to force it in the other direction.

CAUTION: Be careful not to hit the rubber blades of the printhead cleaning system.

9. Unpack the new crash sensor leg.

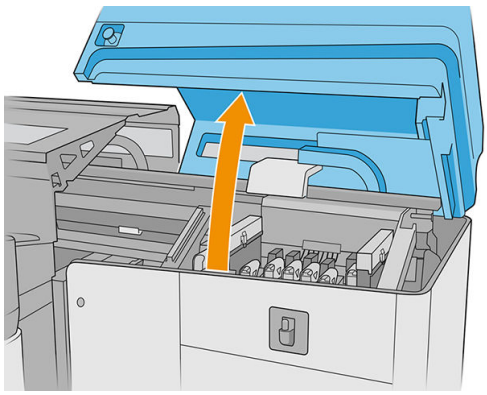
10. Present it rotated by 45°; once it is in place, turn it to vertical.



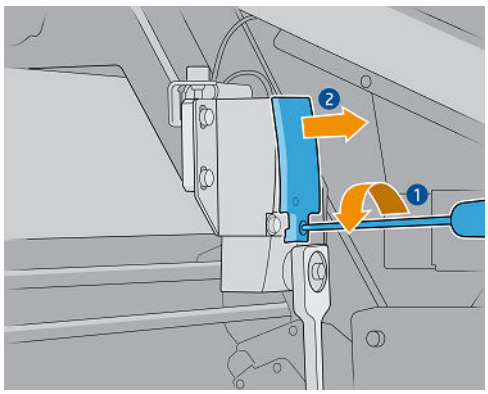
11. Put back the black cover.
12. Put back the yellow part and attach it with the screw.
13. Put back the metallic part and tighten the screws.

Replace the rear crash sensor leg

1. Turn off the printer and the power-enable switch.
2. Open the carriage cover.

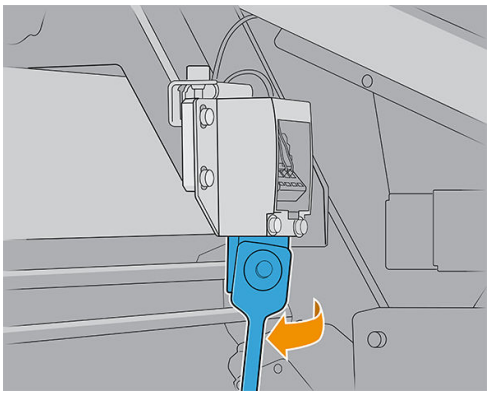


3. Manually move the carriage to the service position (at the far right).
4. Loosen the screw that holds the yellow part, and remove both the part and the screw.



5. Move the carriage slightly to the left, to avoid touching the printhead cleaning roll when removing the leg.

6. Turn the crash sensor leg clockwise (looking at it from above) and remove it.



7. Unpack the new crash sensor leg.
8. Present it horizontally; once it is in place, turn it clockwise.
9. Put back the yellow part and attach it with the screw.

Replace the alignment bar

Risk of burns

Crush hazard

Risk of trapped fingers

Hazardous moving part

Electric shock hazard

For more safety information, see Safety precautions on page 3

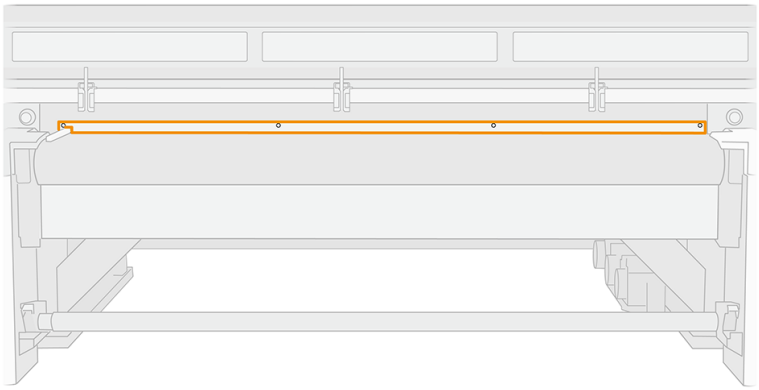
http://www.hp.com/go/latexRseries/replace_alignment_bar

1. Ensure that the printer is not printing.
2. Move the the front alignment bar to the service position.
3. Turn off the printer.

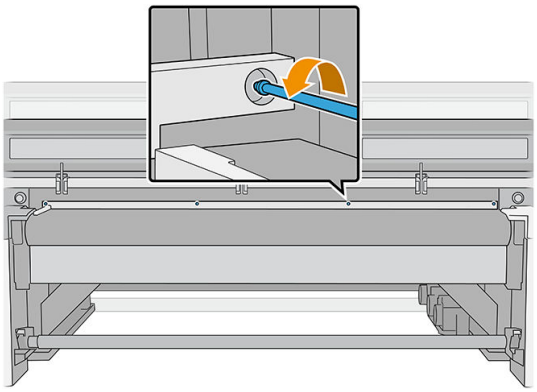
IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

4. Move the carriage carefully to the right until it stops.

5. Locate the alignment bar in the substrate path on the input side of the printer.



6. Unscrew and remove the front alignment bar. Five screws have to be removed.



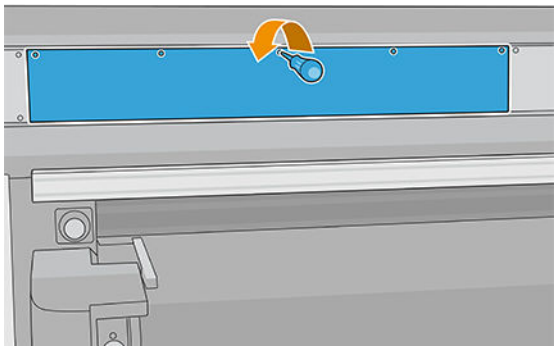
7. Install the new alignment bar and attach it with the the screws you removed earlier.
8. Turn on the printer.
9. Wait until the rearm button blinks, then press the rearm button.
10. Wait until the printher has finished starting up.

IMPORTANT: The printer status in the back screen should change from **Booting** to **Idle**.

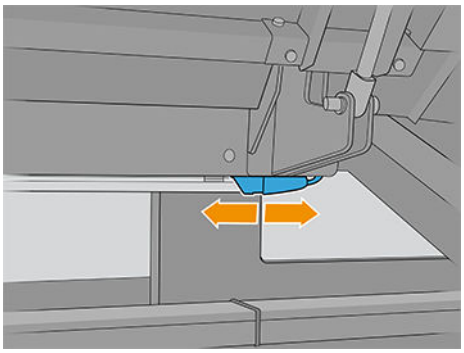
11. Calibrate the alignment bar.
12. Tap **Next** to finish this maintenance operation.

Replace the print-zone lights

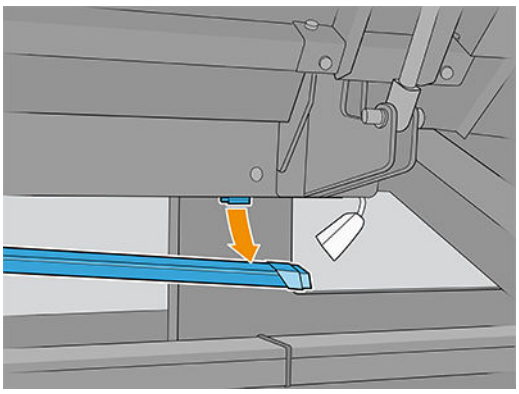
1. Turn off the printer and the power-enable switch.
2. Remove five Torx 15 screws from the scan-axis cover on the input side.



3. Unscrew all the other covers.
4. Disconnect the print-zone lights.



5. Remove the LED bar, unclicking it from the guides.



6. Dispose of the old LED bar, following local regulations.
7. Place the new LED bar on the guides.
8. Reconnect the lights.

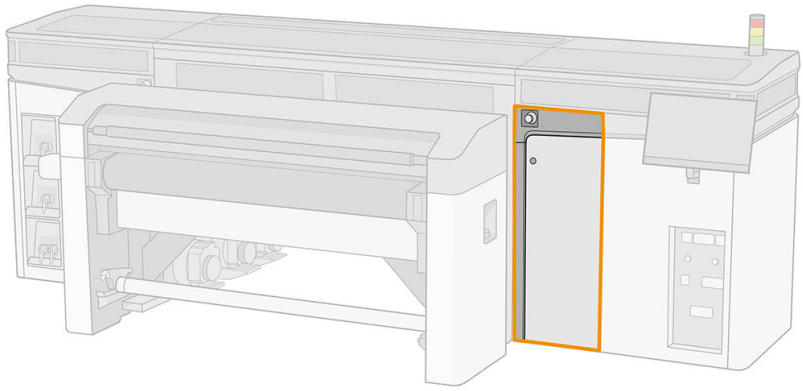
Replace the printhead cleaning waste bottle

Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

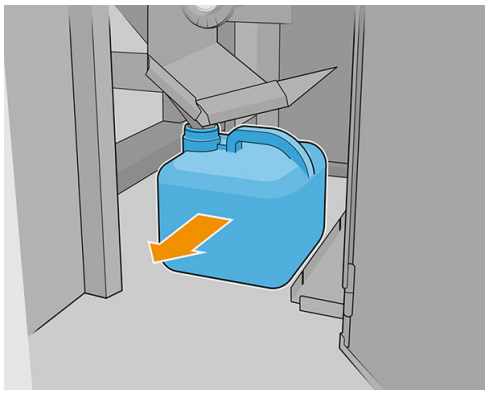
1. Ensure that the printer is not printing.

2. Unlock and open the printhead cleaning roll door.



3. Remove the waste bottle.

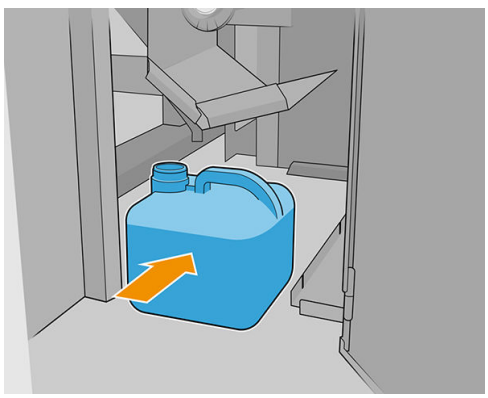
TIP: You are recommended to wear gloves for this operation.



4. Empty the waste bottle.

NOTE: The bottle contains a mixture of ink additives and water. Dispose of this mixture according to local regulations. You can find the Safety Data Sheets (SDS) for the ink at http://www.hp.com/go/msds.

5. Replace the emptied bottle with the new bottle and put it in place. Take care that the mouth of the bottle is well positioned to receive the liquid falling from above.



6. Close the printhead cleaning roll door.

Replace the plastic needles in the auxiliary printhead storage box

Risk of burns

Crush hazard

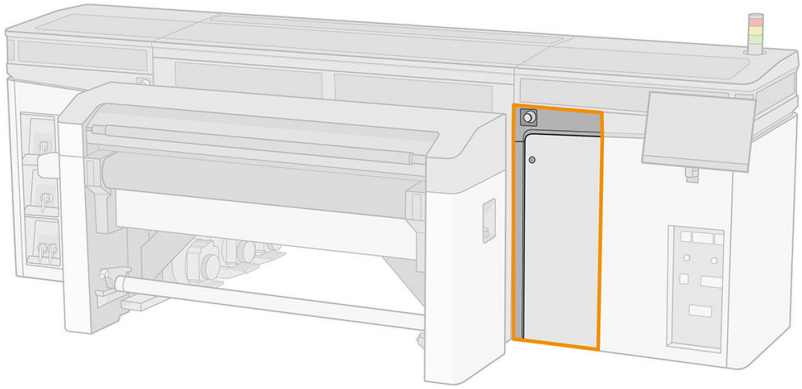
Risk of trapped fingers

Hazardous moving part

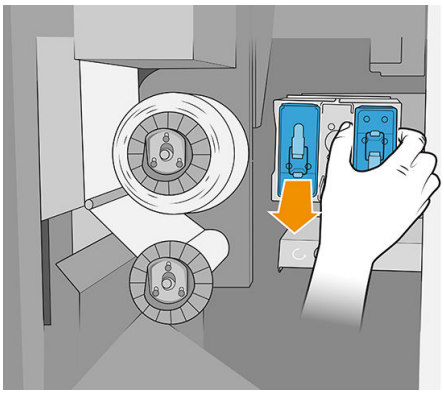
Electric shock hazard

For more safety information, see Safety precautions on page 3

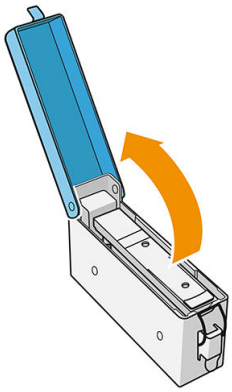
1. Open the printhead cleaning roll door.

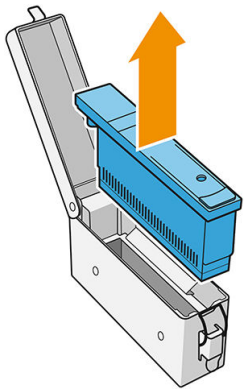


2. Remove the storage box from the wheel.

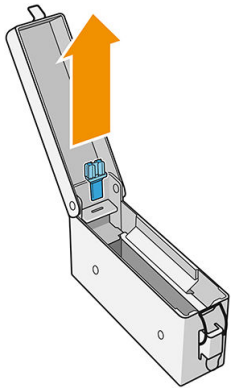


3. Open the storage box and remove the printhead inside, whether the auxiliary or the white printhead.



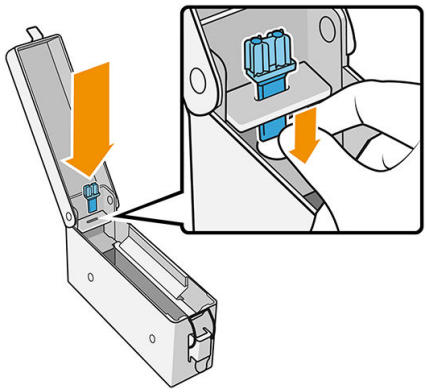


4. Remove the plastic needles by pulling them from the top.

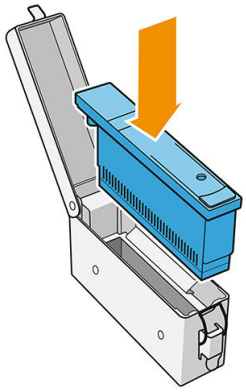


5. Unpack the new plastic needles and insert them into the hole. Pull from below to insert the plastic into the hole.

TIP: Use pliers if necessary.



6. Reinsert the printhead that was in the storage box, and close the box.



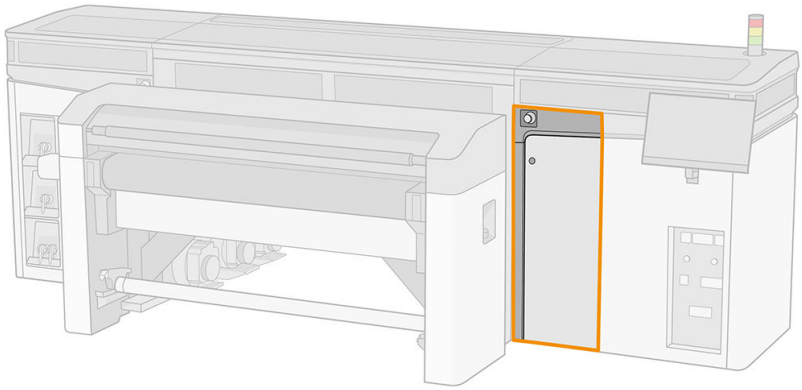
7. Put the storage box back into the wheel.
8. Close the printhead cleaning roll door.

Replace the auxiliary printhead

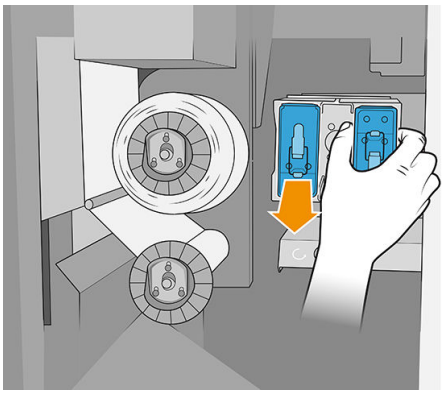
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard

For more safety information, see Safety precautions on page 3

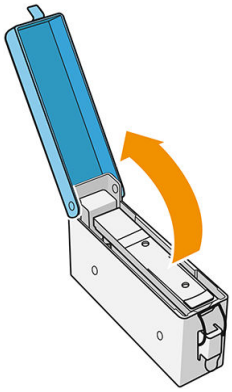
1. Open the printhead cleaning roll door.

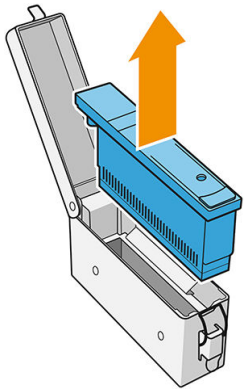


2. Remove the storage box from the wheel.

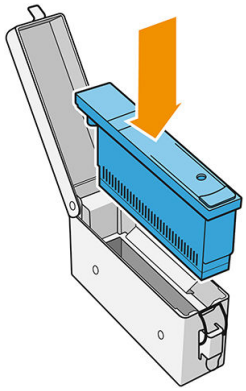


3. Open the storage box and remove the auxiliary printhead.





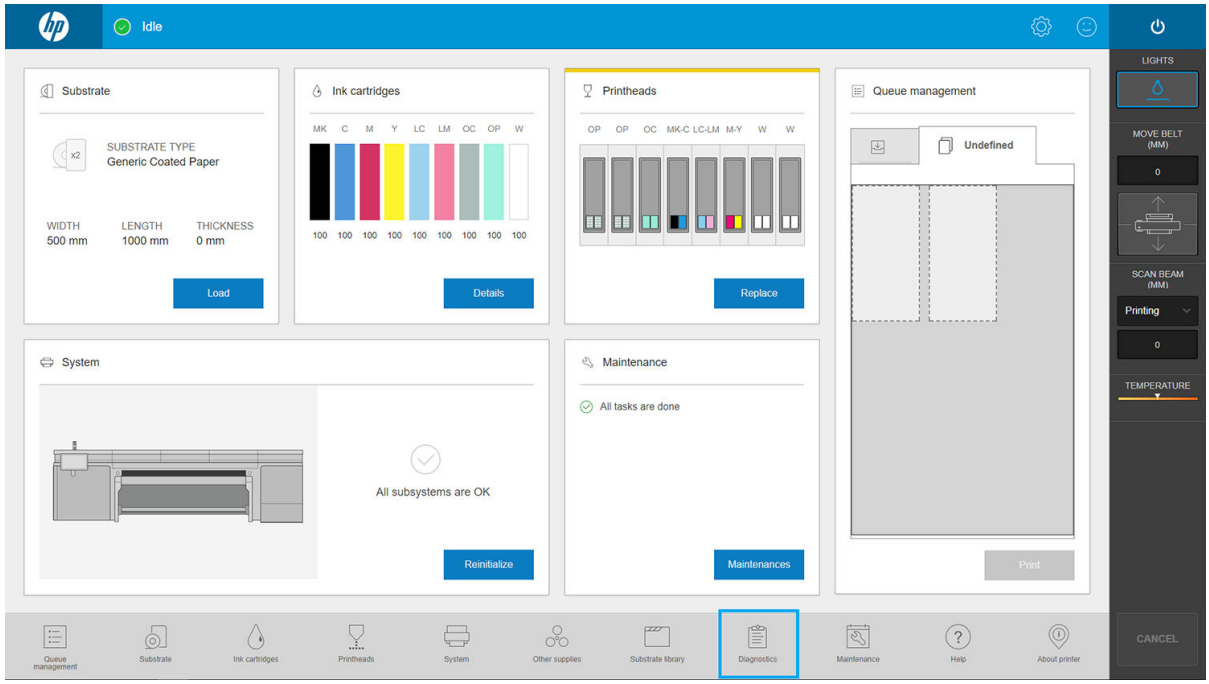
4. Insert the new auxiliary printhead, and close the box.

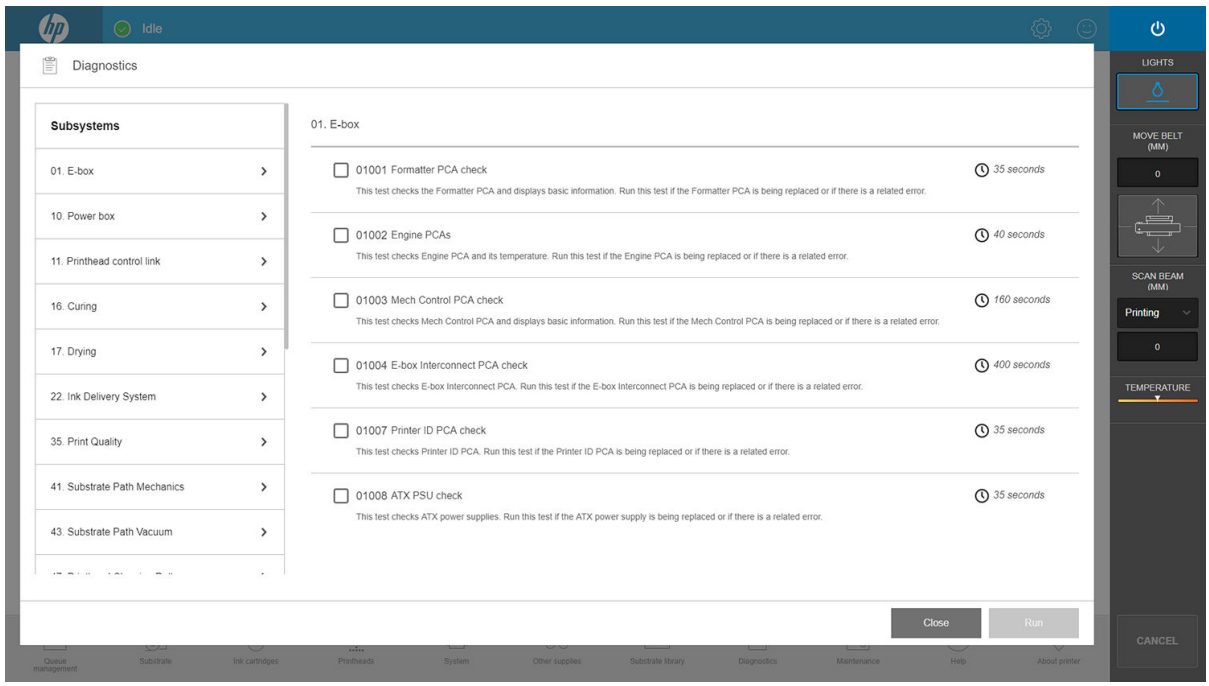


5. Put the storage box back into the wheel.
6. Close the printhead cleaning roll door.

10 Diagnostics

You can access diagnostics that help you to minimize downtime, by tapping at the bottom of the Internal Print Server's main window.





In the **Diagnostics** window you can manage the various diagnostic options. Most of these diagnostics can be run with the printer started normally. However, if you experience a severe error in the start-up progress that prevents you from running the diagnostics, an extra start-up mode has been provided for this situation. To use it, press the power button and tap **Restart in diagnostic mode**. Then the printer will start only a minimal set of components. You can then go to the **Diagnostics** app and run the diagnostic you need.

NOTE: Read the descriptions of the diagnostics and follow the instructions.

IMPORTANT: When the printer is started in diagnostic mode, it is unable to print.

When you have finished the diagnostics, press the power button and tap **Start in normal mode**.

When you call your service representative to report an issue, pass on the results of any diagnostics that you ran.

When you get a message from the printer with a numerical code in the form XXNN-XXXX-XXXX, the NN part of the mode is related to the subsystem, and can be found in the following table.

Number	Subsystem
01	E-box
10	Power box
11	Printhead control link
16	Curing
17	Drying
22	Ink distribution system
27	Printhead
41	Substrate path mechanics
43	Substrate path vacuum system
45	BIOS
46	Printer ID PCA
47	Printhead cleaning roll
48	Lift mechanisms
49	Carriage aerosol
50	Substrate advance sensor
52	Drop detector
55	Carriage sensors (line sensor)
58	Carriage sensors (spectrophotometer)
80	User interface
86	Scan axis
88	Printhead primers
90	Internal firmware errors

NOTE: Some of these subsystems may be available only to service engineers, because they require specific knowledge or for safety reasons.

NOTE: In any case we recommend running the Safety Interlocks diagnostic to ensure that printing is not disabled by a safety interlock.

11 Troubleshoot substrate issues

- Loading issues
  - The substrate cannot be loaded successfully
  - The substrate cannot be measured successfully
  - The substrate has jammed
  - The flexible substrate is not attached to the core and/or spindle
  - The substrate is not flat
- Printing issues
  - There are physical marks on the substrate
  - Rigid substrate too close to the carriage bottom
  - A spindle latch suddenly opens during flexible substrate printing
  - The substrate advances with a loud continuous sound of vibration
  - There is skew or telescoping on the output spindle
  - There are wrinkles and ink smears on the substrate
  - There are ink marks on the substrate
  - There are drops of ink on the substrate
- Flexible-substrate print-length issues
  - The print is shorter than expected
  - How to achieve better consistency between jobs of the same length

Loading issues

The substrate cannot be loaded successfully

- A substrate cannot be loaded unless all printer subsystems (such as the ink system) are ready.
- If the Internal Print Server displays a message about loading errors, follow the instructions on the screen.

If you are using a roll of flexible substrate:

- Check that the spindle is correctly inflated.
- Try using the Internal Print Server to advance the substrate at least 3 m (10 ft), then move it back and try to load it again. If it will not load, perhaps the substrate is not attached to the input core: try a different roll.

The substrate cannot be measured successfully

- When using dark or transparent substrates, the line sensor cannot detect the substrate edges. You can enter the substrate's width and position manually into the Internal Print Server.
- If the alignment bar fails to measure the thickness of the substrate correctly, enter it manually into the Internal Print Server.

The substrate has jammed

There are various kinds of substrate jams that can occur. If the printer reports a jam, follow these steps:

1. Press an emergency stop button as quickly as possible to minimize damage to the printheads.

NOTE: The printer may shut itself down automatically.

2. Wait about 10 minutes for the printer to cool down.
3. Open the top cover.
4. Open the curing module.
5. Remove all substrate and pieces of substrate from the printing zone and from any other parts of the printer into which they may have fallen. Check the curing zone in particular. Make sure that nothing remains on the substrate path. If you are unable to remove all obstructions, call your service representative.
6. Start the printer in diagnostic mode.
7. Raise the carriage beam and the curing module, and check underneath for any pieces of substrate.
8. Lower both to their normal positions.
9. Before restarting the printer, check that all circuit breakers are on and all emergency stop buttons released.
10. Restart the printer in normal mode.
11. Reload the substrate.

The flexible substrate is not attached to the core and/or spindle

If the printer detects a lack of tension during the substrate check after loading, it will ask you to confirm the winding direction.

If the roll is not firmly attached during printing, you may see banding on your prints, or hear metallic noises.

If you see an error message numbered 1041-0006-0184 or 1041-0006-0186 while printing, it means that the substrate may have become detached from the spindle, or the core is slipping on the spindle. This could mean

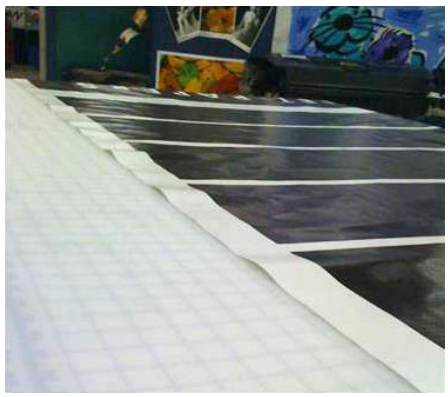
that you have reached the end of the roll, or the spindle is not correctly inflated, or the dual-roll differential hub is locked. The substrate is automatically unloaded when this error occurs.

You should respond to this error in the following ways:

- Check whether you have reached the end of a roll.
- Check that the spindle is correctly inflated.

The substrate is not flat

If the substrate does not lie flat on the extension table, but has shallow waves in it, you may suffer carriage crashes or see defects in the printed image. Ensure that the belt vacuum is sufficient to keep the substrate flat on the belt during the loading process.



1. Check that the substrate type you have loaded corresponds to the substrate type selected in the Internal Print Server and in your software.
2. Check that there are no defects at the edges of the substrate.

Printing issues

There are physical marks on the substrate

This only can occur when substrates sensitive to permanent deformation are used. These marks are usually seen in isolated areas and mainly caused by high curing temperature or substrate tensions.

Here are some suggested ways to correct the problem:

1. Check that the substrate you are using is the same type as the one you have selected in the Internal Print Server.
2. Check that there are no defects at the substrate edges.
3. Check that you are using the generic substrate preset for the substrate category. The use of incorrect values could cause incorrect substrate behavior.
4. Flexible substrate only: Reload the substrate and try to minimize skew while loading. Check that you are loading the substrate using the correct procedure.
5. Try to reduce curing temperature and ink quantity if possible, and raise the curing airflow to help in reducing the substrate deformation.

Rigid substrate too close to the carriage bottom

If a rigid substrate is too close to the bottom of the carriage, the crash sensor cancels the job.

- Ensure that the substrate thickness is entered correctly in the Internal Print Server.
- Ensure that the substrate lies flat on the substrate-advance belt while printing. In particular, check that the substrate is not deformed.
- Ensure that the substrate you are using is the substrate selected in the Internal Print Server.
- Ensure that the substrate edges have no defects.

A spindle latch suddenly opens during flexible substrate printing

If a spindle latch is not closed before starting the substrate load, or it is opened by someone after the spindle was already moving or while the substrate was under tension, the spindle can move out of place. Closing the latch in those conditions can cause an incomplete latch engagement, and then at some point the latch may spontaneously open completely.

The best solution is to eliminate substrate tension, avoid spindle movement, and then close the latch properly. To do this, return to the substrate load/unload menu, ensure that the spindle is properly in place (in case of doubt, extract it a bit and then push it back fully inside again), then close the latch (the blue part should now go down completely).

The substrate advances with a loud continuous sound of vibration

A loud continuous sound of vibration during the substrate advance can be caused in the following ways:

- The input spindle is not applying tension.
- Wrong tension or vacuum settings result in an incorrect balance of forces on the main roller.

If you hear this sound, here are some suggestions:

1. Check that the substrate you are using is the same as the one you have selected in the Internal Print Server.
2. Check that you are using the generic substrate presets for the category. The use of incorrect values may result in incorrect substrate behavior.

   NOTE: Only substrates with high friction along the substrate-advance belt or substrates that easily wrinkle with temperature need high output tension values. Check that your output tension is recommended for your substrate.

3. Check that there is no telescoping of the input roll.
4. Reload the substrate and try to minimize skew while loading. Check that you using the correct loading procedure.
5. Increase the input tension in steps of +5 N/m from the recommended setting for each category until you eliminate the issue.

There is skew or telescoping on the output spindle

Extreme skew (approximately 10 mm peak to peak) and telescoping in the output spindle while it winds can be caused in three main ways:

- The substrate has not been correctly loaded and aligned during the loading procedure.
- The roll loaded on the input spindle is skewed, and this skew is transferred to the output spindle.
- The roll loaded on the input spindle has been wound with different tensions at its two ends.

  Printing on rolls that are not wound accurately during manufacturing may lead to wrinkles and skew problems and, generally, this problem can be identified easily because you can see a loss of tension at one

side of the substrate between the input roll and the main roller. In that case, see the relevant information provided in the section There are wrinkles and ink smears on the substrate on page 240.

TIP: When suffering from extreme skew that tends to increase (normally with highly temperature-sensitive substrates), try to use a thicker core that is not deformed by the rubber traction grooves on the spindle when inflated. Then follow the guidelines below for reducing skew.

Generally, the main contributor to skew is an imprecise substrate load, and the effects of that are worse with wide rolls. However, if you have some skew or telescoping but this does not affect your print quality, and does not generate wrinkles in the substrate (see There are wrinkles and ink smears on the substrate on page 240), there is no need to take any action.

IMPORTANT: HP recommends using the automatic de-skew process in all roll loads.

There are wrinkles and ink smears on the substrate

Wrinkles in the substrate indicate that the substrate settings that control the substrate shape are not optimized. This can cause various printing defects:

- Colored bands in area fills in the vicinity of the wrinkles
- Ink smears if the printhead touches the substrate
- Cockle
- A substrate crash if the printhead's movement over the substrate is impeded

There are various reasons why wrinkles and other consequent effects could appear while printing:

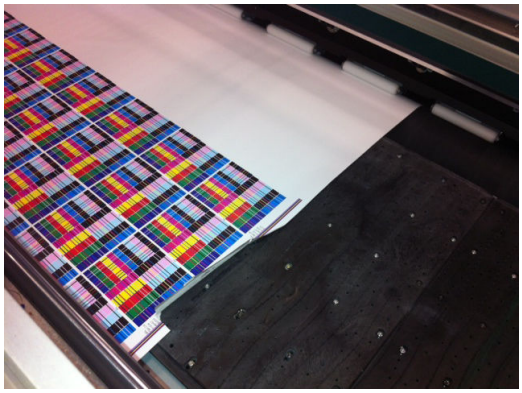
- Incorrect loading of the substrate
- Incorrectly positioned edge holders
- Drying and curing temperatures too high for the substrate
- Differential expansion of the substrate due to variations in temperature
- Insufficient tension settings
- Non-uniform tension across the substrate when loading
- The roll loaded on the input spindle has been wound with different tensions at its two ends.

NOTE: When printing with rolls that have not been precisely wound with the same tension along their width during manufacturing, you may notice that, while printing, one of the sides of the substrate between the input spindle and the main roller loses all tension. This may cause wrinkles on the substrate-advance belt or telescoping on the output spindle.

If your prints suffer from any of the defects caused by wrinkles, here are some suggestions:

1. Check that the substrate you are using is the same type as the one you have selected in the Internal Print Server.
2. Check that you are using the generic substrate preset for the substrate category. The use of incorrect values may cause incorrect substrate behavior.
3. Check that there is no telescoping of the input roll.
4. Reload the substrate and use the automatic de-skew process (see Automatic measurements on page 44). Check that you are loading the substrate using the correct procedure.

5. If you have experienced a substrate crash because the lateral edge of the substrate in the print zone is not flat enough, and is raised or even partially cut because you are not using edge holders, then you are recommended to use them.



NOTE: If you are already using edge holders, check that they are correctly positioned.

6. Try reducing the drying power and curing temperature.
7. Try reducing the curing temperature and ink quantity, and raise the curing airflow to help in reducing the substrate's thermal contraction.
8. If you cannot get rid of the wrinkles, try raising the carriage beam slightly, so that the printhead is not so close to the substrate.

For information on how to adjust printer settings, see Edit a substrate preset on page 81.

There are ink marks on the substrate

This problem can occur if any component in contact with the substrate is dirty. Check the substrate-advance belt, pinchwheels, and curing module plates, and clean them if necessary.

If the ink marks occur at the sides of the substrate and not in the center, and you are using the substrate edge holders, check that they are correctly placed and clean.

There are drops of ink on the substrate

NOTE: In the above example, the distance between the drops is about 1 cm (0.4 in).

1. If you are using the substrate edge holders, clean them.
2. Clean the sides of the printheads and the sides of the printhead slots.
3. Clean the electrical connections to the printheads. See The Internal Print Server recommends replacing or reseating a printhead on page 262.

Flexible-substrate print-length issues

The print is shorter than expected

Some substrates naturally contract when they are printed on and cured, this can mean the total length of the print is shorter than expected. If this is the case, you can expand the length of the print from the RIP, which will compensate for the contraction of the substrate. Alternatively, change to a less thermal-dependent substrate to reduce the contraction.

How to achieve better consistency between jobs of the same length

The printer has been designed to maximize consistency in the length of the printed substrate. However, there are external variables that can contribute to variability: substrate variations and enviromental conditions.

1. Select a substrate that is less susceptible to expansion when being printed on. Most paper-based substrates have a tendency to expand.
    - If you need to print on a substrate susceptible to expansion:
        - Ensure that the density of ink is similar between each tile (if not, the tile with less ink might be shorter).
        - If possible, decrease the heating temperature.
        - Reduce the ink restrictions as much as possible.
    - Make sure that the roll is left within the room where the printer is located for at least 24 hours, this is to ensure the complete roll has the same temperature as the printer.
2. Do not touch the print adjustments (no change of substrate advance compensation) between tiles.
3. Print all the tiles at once.
    - Do not split the jobs at different times (1 tile one day, and the 2nd tile the 2nd day)
    - Do not change the print mode or the substrate width between tiles.

    To print the tiles all at once, we recommend the following:

    a. Create the tiles from the Internal Print Server.

    b. If you are creating the tiles from the RIP, ensure that you send all the tiles within the same jobs sent to the printer/Internal Print Server.

    The objective is to make sure that there is no pause between the tiles. When using the Queue mode in the Internal Print Server, there is still a small time between jobs, which could add more variability between the lengths of the tiles.
4. In order to make sure that even the first tile has less difference in length compared with the other ones, add a top margin of 50 cm.

    In case you have to reprint one tile, in order to ensure the length will be as close as the previous jobs:

    - Make sure that the substrate and also the ambient temperature of the printer are the same as when the previous job was printed.
    - Add a top margin of 50 cm.

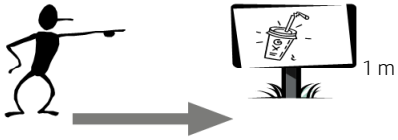
    But in any case, when having to reprint a tile later, there is a higher probability that the length will be different from the other tile length. The total length repeatability depends on the substrate, the changes in environmental conditions, and the contents of each job (mainly when the substrate is reacting differently depending on the ink density).

12 Troubleshoot print-quality issues

- General advice
- Basic and advanced troubleshooting
  - Basic print-quality troubleshooting
    - Printhead check and clean
    - Substrate-advance sensor check
    - Printhead alignment
- Advanced print-quality troubleshooting
  - Print-quality artifacts troubleshooting
    - Horizontal banding
    - Color misalignment
    - Bleed, halo, wicking
    - Low gloss, haze
    - Color accuracy
    - Color variations when tiling
    - Edge roughness, text quality
    - Graininess
  - Physical deformation marks
  - Poor curing
  - White-to-color misalignment
  - Static electricity
  - Dual-side marks

General advice

Your printer has been designed and qualified to the highest standards to provide the optimal compromise between print quality and productivity. Prints for outdoor use can accommodate more visible defects as they are viewed from a long distance. For shorter distances, as in indoor advertising, defects need to be less visible. To decide whether a defect is considered acceptable, as a rule of thumb, the table below shows the appropriate viewing distances.

Print mode	To view output at...
4 pass (outdoor)	
6 pass (indoor)	
12 pass (high quality) and white printmodes	Any distance

You are recommended to review the acceptability of a defect according to this table before proceeding to diagnose it to make sure the selected print mode is the most appropriate for the purpose of the job. Increasing the number of passes to 8 or more enables higher ink quantities if needed and/or the use of difficult printing materials thanks to the longer drying and curing times. Print modes with more passes are more resistant to banding. In general, follow these recommendations:

- Avoid touching the substrate before printing, as fingerprints can detract from print quality.
- Avoid touching the substrate while printing is in progress.
- Judge the print quality after the print has completely emerged from the printer. In some cases, defects seen while printing disappear after the image is completely cured.
- Check that the environmental conditions (room temperature and humidity) are in the recommended range. See Environmental specifications on page 295.

Before troubleshooting, check the following points:

- To achieve the best performance from your printer, use only genuine HP supplies and accessories, whose reliability and performance have been thoroughly tested to give trouble-free performance and best-quality prints.
- Check that the substrate type selected in the Internal Print Server is the same as the substrate type loaded into the printer.

  ⚠ CAUTION: If you have the wrong substrate type selected, you could experience poor print quality and incorrect colors, and perhaps even damage to the printheads.

- Check that you are printing on the right side of the substrate.
- Check that you are using in the RIP software the correct substrate preset, which includes the ICC profile for your substrate and print mode.
- Check whether there are any outstanding printer alerts in the Internal Print Server. React to the alert as instructed in this guide.

In particular:

- Make sure the substrate is flat and has no wrinkles. See Troubleshoot substrate issues on page 236.
- Check that the substrate has no skew or telescoping. Check that you are loading the substrate using the correct process. See Load a roll into the printer on page 55.
- For color consistency issues, check that the color calibration was performed when the substrate was added to the Internal Print Server. See Use a new substrate on page 75.
- Make sure it has also been performed in the current conditions, especially considering substrate batch and printheads. See Color calibration on page 124.

Basic and advanced troubleshooting

The print-quality troubleshooting process is divided here, for convenience, into two levels: basic and advanced.

- Basic troubleshooting will help to resolve the majority of the typical print-quality issues related to banding, graininess, and printhead alignment.
- Advanced troubleshooting helps to resolve the above issues when the basic steps did not work, but it also covers other possible print-quality defects, diagnosis, and resolution.

Basic print-quality troubleshooting

1. Identify the defect. This basic procedure applies to the following defects:
   - Horizontal banding
   - Graininess
   - Color misalignment
     - Blurred lines, edges, and text, horizontally and vertically
     - Halo of a different color around color lines and at the edges of color areas or text
     - Ink bleeding or wicking or different gloss at the edges of color areas
2. Perform the actions described in the following table.

Defect	Optimizer printhead check	Printhead check and clean	Substrate-advance sensor check	Printhead alignment	Possible causes (for reference only)
Horizontal banding	X	X	X	X	• Blocked nozzles • Substrate defect • Substrate-advance accuracy
Isolated bands (usually of different texture or grain)			X		• Substrate-advance accuracy and navigability
Graininess	X		X	X	• Substrate-advance accuracy • Substrate thickness • Substrate plasticizers • Color alignment

Defect	Optimizer printhead check	Printhead check and clean	Substrate-advance sensor check	Printhead alignment	Possible causes (for reference only)
Blurry edges or text lines, horizontally			X	X	• Substrate-advance accuracy • Substrate thickness • Color alignment
Blurry edges or text lines, vertically				X	• Color alignment
Color halo on objects (e.g., magenta shows up under a blue line)				X	• Color alignment
Ink bleeding, wicking, or different gloss at the edges of color areas	X			X	• Optimizer alignment • Optimizer level
White halo around objects			X	X	• White alignment • Substrate-advance accuracy

Printhead check and clean

See Check and clean the printheads on page 97. The check and clean process will check the printheads, recover the ones with blocked nozzles, and replace the nozzles that are not recovered with healthy ones for printing.

Substrate-advance sensor check

Run the OMAS diagnostic test.

NOTE: OMAS stands for Optical Media Advance Sensor, usually known as the substrate-advance sensor in this guide.

The test will tell you whether the substrate-advance sensor is working correctly or not (either dirty or damaged).

If the substrate-advance sensor is dirty, clean the sensor. See Clean the substrate-advance sensor on page 185.

For best results, cleaning the substrate-advance sensor is included in the printer's weekly maintenance.

Printhead alignment

Automatic alignment is recommended. See Automatic alignment procedure on page 115.

In case you want to perform manual printhead alignment, see Manual alignment procedure on page 117.

The result of the alignment can be verified with the printhead alignment diagnostics plot. See Printhead alignment diagnostics plot on page 121.

Advanced print-quality troubleshooting

If the basic print-quality troubleshooting does not solve the problem, here are some further procedures that you can try.

One of the most important parts of print-quality troubleshooting is to ensure that the printheads are healthy. See Printhead health troubleshooting on page 263.

Print-quality artifacts troubleshooting

Horizontal banding

Horizontal banding means that your print suffers from added horizontal lines or bands, in a regular pattern. They can look different depending on the cause:

- Thin dark lines
- Thin white lines
- Bands of light and dark zones
- Gloss banding
- Aeroworms
- Banding in white-ink applications
- Image content-dependent banding
- Local color variations
- Microbanding

Thin dark lines

These are thin dark lines across the entire image with certain frequency, more easily seen in solid area fills. There are two likely causes:

- **Printhead alignment.** This is a clear contributor to banding. If printheads are not correctly aligned, the misplaced dots could correlate directly with the severity of the banding, by putting more ink in the same place and thus creating darker lines.

  To check printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121). As a general rule, the biggest contributors to thin-dark-line banding caused by printhead alignment are (in this order):

  – Inter-color alignment (alignment between different colors)

  Here are some tips for solving this problem:

  – If the printhead alignment was done with a different substrate of different thickness, probably a new printhead alignment is needed.

  – Fine-tune the alignment by identifiying the offenders in the printhead alignment diagnostics plot. See Automatic alignment procedure on page 115.

- **Substrate advance.** Before trying to adjust any parameter, make the following checks:

  – Check that no substrate-advance factor was set earlier that could prevent the substrate-advance sensor from working correctly.

  – Run the diagnostics to check that that the substrate-advance sensor is not dirty.

  If the substrate advance is not well adjusted, particularly if it is under-advancing, a dark line can appear between passes.

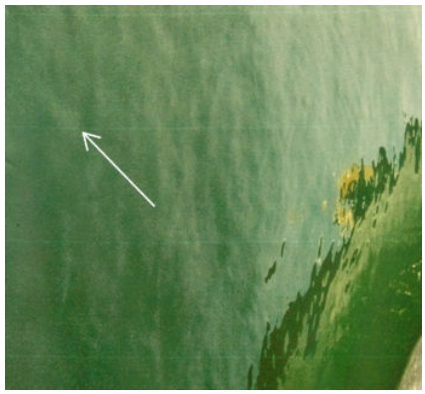
  A clear symptom of this is when the dark lines appear across all colors, because the cause is common to all of them. To confirm it, in the Internal Print Server, tap **Printer** > **Advance Calibration** to check the substrate advance. See Substrate-advance test print on page 128.

  You can usually correct this problem by adjusting the substrate advance compensation (see Substrate-advance compensation on page 128). However, you are recommended to run the OMAS Diagnostic Tests

from the maintenance window as soon as the substrate is unloaded, to avoid having the same problem with other substrates. See Clean the substrate-advance sensor on page 185.

Thin white lines

These are thin white/light lines across the entire image at regular intervals, more easily seen in solid area fills.



There are three likely causes:

- **Nozzle clogging.** A printhead nozzle can be sealed temporarily, by some fibers or dirt in the ink bore. Then not all the ink is fired and a lighter horizontal band appears. Sometimes a bigger drop with all the accumulated ink appears at the end of this light thin line, meaning that the bore is clear then. See Printhead health troubleshooting on page 263.
- **Printhead alignment.** This is a clear contributor to banding. If printheads are not correctly aligned, the misplaced dots could correlate directly with the severity of the banding, by leaving lighter bands where the ink should have been placed.

  To check printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121). As a general rule, the biggest contributors to thin-white-line banding caused by printhead alignment:

  – Inter-color alignment (alignment between different colors)

  Here are some tips for solving this problem:

  – Execute automatic alignment.

  – If the printhead alignment was done with a different substrate of different thickness, probably a new printhead alignment is needed.

- **Substrate advance.** Before trying to adjust any parameter, make the following checks:

  – Check that no substrate-advance factor was set earlier that could prevent the substrate-advance sensor from working correctly.

  – Run the diagnostics to check that the substrate-advance sensor is not dirty.

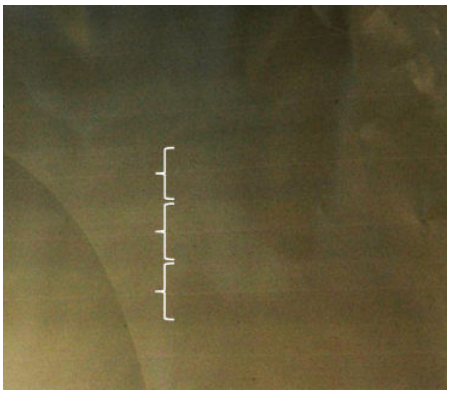
  If the substrate advance is not well adjusted, particularly if it is over-advancing, a white line can appear between passes.

  A clear symptom of this is when the white lines appear across all colors, because the cause is common to all of them. To confirm it, in the Internal Print Server, tap **Printer** > **Advance Calibration** to check the substrate advance. See Substrate-advance test print on page 128.

  You can usually correct this problem by adjusting the substrate advance compensation (see Substrate-advance compensation on page 128). However, you are recommended to run the OMAS Diagnostic Tests from the maintenance window as soon as the substrate is unloaded, to avoid having the same problem with other substrates. See Clean the substrate-advance sensor on page 185.

Bands of light and dark zones

These are periodic horizontal bands formed of a lighter band and a consecutive darker band. This pattern is mostly seen in solid color area fills (such as light purple or gray).



There are three likely causes:

- **Hue shift.** Colors may be slightly different when the carriage is moving in one direction, compared with the other direction, as the order in which colors fall on the substrate is reversed. This can be seen as dark versus light bands, usually visible only in a print mode with 4 passes or fewer.

  Here is a tip for solving this problem:

  - Increase the number of passes.

- **Coalescence.** This is due to an excessive amount of ink, and the ink being misplaced as it is deposited on the substrate, generating bands with more ink than other alternate bands. It can also be caused by firing too much ink in a short time. Coalescence is most likely to be seen in areas of high ink density.

  Here are some tips for solving this problem:

  - Use lower ink density.
  - Increase the number of passes.
  - Change the drying settings. See Edit a substrate preset on page 81.

- **Printhead alignment.** This is a clear contributor to banding. If printheads are not correctly aligned, the misplaced dots could correlate directly to the severity of the banding.

  To check printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121). As a general rule, the biggest contributors to light-and-dark banding caused by printhead alignment are (in this order):

  - Bidirectional alignment
  - Inter-color alignment (alignment between different colors)

  Here are some tips for solving this problem:

  - Execute automatic alignment.
  - If the printhead alignment was done with a different substrate of different thickness, probably a new printhead alignment is needed.
  - Fine-tune the alignment by identifiying the offenders in the printhead alignment diagnostics plot. See Automatic alignment procedure on page 115.

Gloss banding

This appears in dark, high-density areas as horizontal gloss or matte bands about 1 cm wide. It can happen when the curing system settings are not correct for the substrate, when there are problems with the overcoat printhead, or when there is too much overcoat on the substrate.

If the bands are more apparent when tilting the print (1) or changing your viewing position (2), then it is likely to be gloss banding.

To solve the problem, check your curing settings (airflow, curing temperature), and check and clean the overcoat printhead (see Check and clean the printheads on page 97). You could also try using a different print mode.

Aeroworms

Aeroworms consist of thin bands with higher density than the surrounding area. They are about 6 cm long and have a horizontal tendency, but they tend to curve like worms. They are not continuous across the substrate, and seem to appear at random.

When the ink is being fired, there are airflow turbulences under the carriage that can affect the positioning of the drops. Therefore, some waves of ink can be formed and deposited on the substrate to create this effect.

Here are some tips for solving this problem:

- Increase the number of passes.
- Reduce the ink density.
- Check the scan beam distance in the Internal Print Server. If it is higher than normal, try reducing it.
- Check that the aerosol filters are not saturated or broken (see Replace the aerosol filters on page 104).

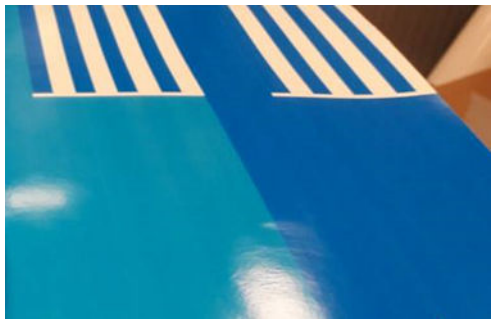
Banding in white-ink applications

You may see periodic horizontal bands formed of a lighter band and a consecutive darker band. Try the following:

- Align the printheads.
- Check the substrate advance.
- Check and clean the printheads.
- Change the drying settings. See Edit a substrate preset on page 81.

Image content-dependent banding

This consists of a color variation that appears in some color area fills that contain cyan.

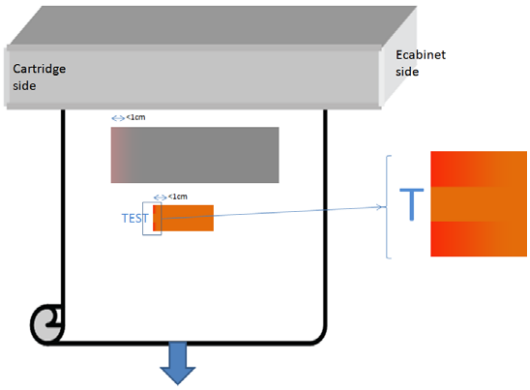


Here are some tips for solving this problem:

- Rotate the image before printing.
- Reduce the ink density.
- Increase the number of passes.

Local color variations

In some cases, at the edges of area fills, a small number of ink drops may be missing or slightly darker, producing a local color variation.



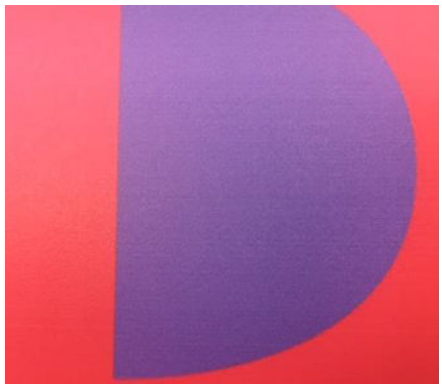
These defects are due to the printheads travelling from side to side without printing.

- In each pass, the first 1 or 2 drops of a color are missing or smaller.
- In each pass, the first 1 or 2 drops of a color are darker because they are more concentrated with pigment.

To resolve these defects, add spit bars at each side of the image, to make sure nozzles are refreshed before printing each pass. If possible, you could also rotate the image to avoid situations such as shown in the example.

Microbanding

This consists of very thin horizontal lines of very high frequency that appear in some area fills. Often they are hardly visible.



Microbanding is probably caused by ink crusting.

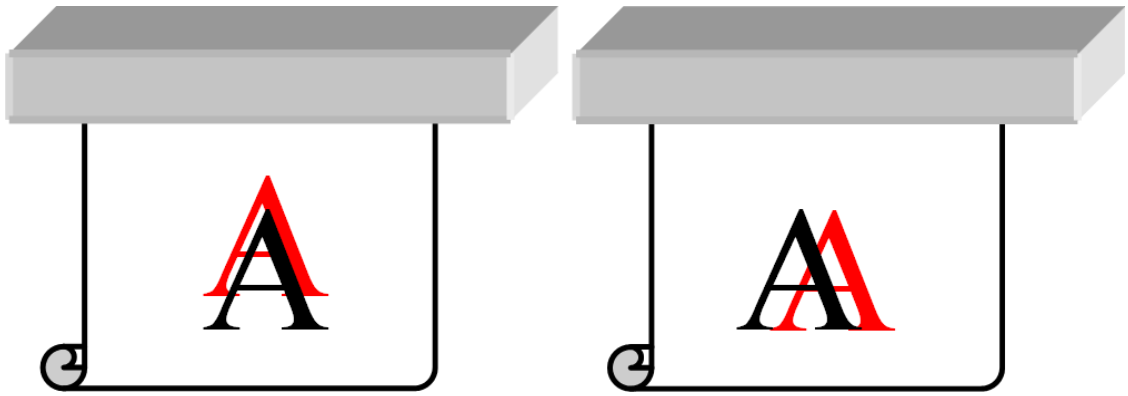
Here are some tips for solving this problem:

- Check and clean the printheads. See Check and clean the printheads on page 97.
- Check and clean the left printhead cleaning blade. See Clean the left printhead cleaning blade on page 140.
- Check that there are no obstacles in the substrate path.
- Increase the number of passes.
- Decrease the amount of ink.

Color misalignment

Colors appear misaligned. Typically, lines and text are most affected by this issue.

It can happen in both axes: the substrate axis and the scan axis.

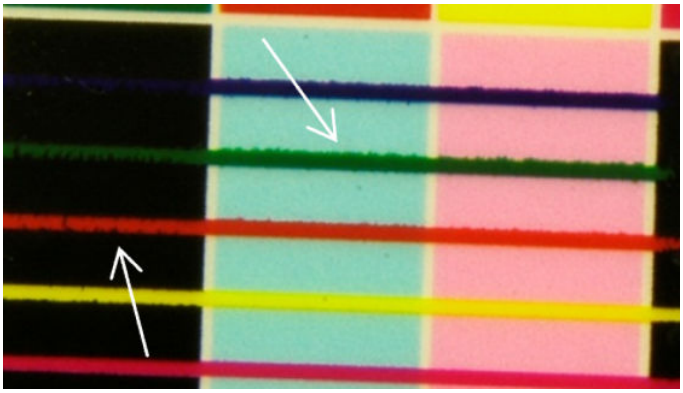


Color misalignment is most likely to be caused by printhead misalignment. To check printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121).

If you see misalignment along the substrate axis, check the substrate-advance sensor.

Bleed, halo, wicking

Sometimes a small color migration may be observed at the border between different colors (bleed). It may also happen at the border between a color and blank substrate (no ink), reducing the sharpness of the shape. On some substrates, a gloss halo can be observed at the border between colors.



There are three likely causes:

- **Optimizer misalignment:** There may be misalignment between the optimizer printhead and the other printheads. To check the printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121). If necessary, perform a manual alignment, then reprint the printhead alignment diagnostics plot.

  If the problem is in the substrate axis direction, it may also be caused by incorrect substrate advance. See Substrate-advance test print on page 128 and Substrate-advance compensation on page 128.

- **Optimizer level**, which may be too low for this substrate and ink density. Other associated defects may also appear, such as coalescence or grain in the area fills due to low wetting of the ink on the substrate. You can correct this problem by increasing the optimizer percentage in the substrate preset.

- **Drying temperature**, which may be too low for this substrate and ink density. Other associated defects may also appear, such as coalescence or grain in the area fills due to low wetting of the ink on the substrate. You can correct this problem by increasing the drying temperature in the substrate preset.

Low gloss, haze

On glossy substrates, the print may have lower gloss than expected. Try decreasing the optimizer percentage in the substrate preset.

Color accuracy

Ideally, the colors that you see on the screen should match the colors in the print. In practice, you may find that the colors are not sufficiently accurate. There are three possible causes:

- **Color calibration** provides consistent colors, but consistent colors are not necessarily accurate. However, if the combination of substrate and printheads has not been calibrated recently (or ever), that is a possible source of color inaccuracy. You can eliminate the possibility by performing a color calibration (see Color calibration on page 124).

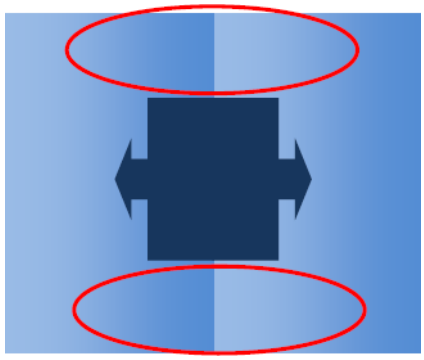
- **ICC profile.** If you are using the wrong profile, your colors are likely to be inaccurate. Check which profile you are using. If necessary, you can make your own ICC profile for the printer, printheads, print mode, and substrate that you are using.

- **Ink density**, which affects color saturation. If the color saturation of your print seems wrong, try changing the ink density in the substrate preset; you may need to change the number of passes at the same time.

NOTE: If you are trying to print a specific color (such as a PANTONE value, or the same color as from another printer), you should apply the ICC profile using the colorimetric rendering intent.

Color variations when tiling

When tiling, it is important that all tiles have the same length and that the colors of the mating edges match. This section focuses on color variations; for recommendations about length consistency, see How to achieve better consistency between jobs of the same length on page 242.



Possible causes

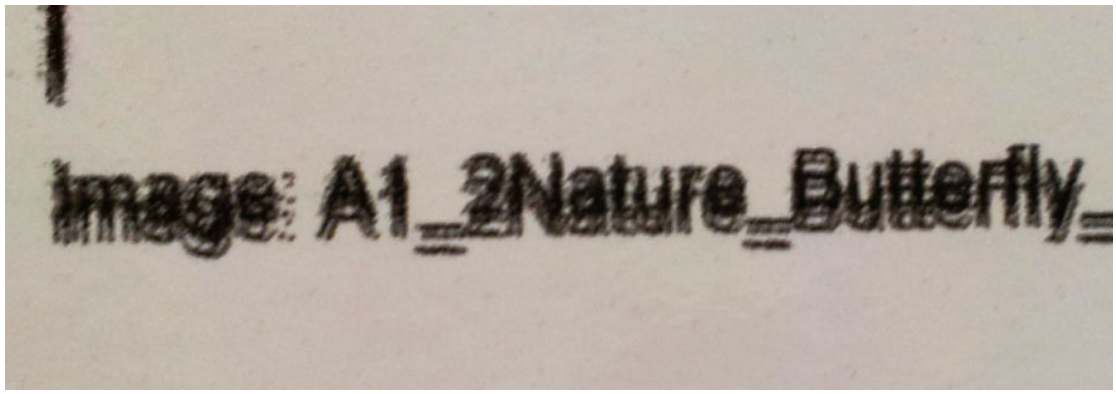
- **Uniform variations from tile to tile.** When color changes uniformly it must be within the color consistency specification; see Color consistency on page 41 for more details. Usually grays are much more sensitive: differences of less than 2 dE 2000 may be visible, although other colors would not show a difference.
- **Small color variation left to right.** The tile itself looks uniform, but when putting it beside the adjacent tile the differences become visible.
- **Local color variations.** See Local color variations on page 251. Sometimes these defects become visible only when printing tiles, showing in one of the tiles but not in the adjacent. They are also more visible when printing grays.

Possible solutions

- Try to ensure uniform printing of all tiles, and all tiles printed in the same run.
- Rotate every other tile, to compensate for left to right differences.
- Adding spit bars at both sides of the image helps overall, especially when there are local color variations.

Edge roughness, text quality

The edges of objects may appear rough or blurred; this is especially noticeable in text.



There are five possible causes:

- **Bleed:** see Bleed, halo, wicking on page 253.
- **Printhead alignment.** As ink could be deposited by a combination of different colored printheads, it is important that all printheads are correctly aligned. To do so, print the Printhead alignment diagnostics plot on page 121, and correct any misalignment.
- **Substrate advance.** Before trying to adjust any parameter, make the following checks:
  - Check that no substrate-advance factor was set earlier that could prevent the substrate-advance sensor from working correctly.
  - Run the diagnostics to check that the substrate-advance sensor is not dirty.

  If the substrate advance is incorrectly adjusted, particularly if it is under-advancing, a dark line can appear between passes. When the problem of line roughness or text quality applies to all colors and appears in the substrate axis direction, it is likely to be related to incorrect substrate advance. Another clue that could point to substrate advance as a cause is to observe that the defect is not constant, appearing and disappearing along the print in the substrate axis.

  To confirm it, go to the Internal Print Server and tap **Printer** > **Advance Calibration** to check the substrate advance. See Substrate-advance test print on page 128.

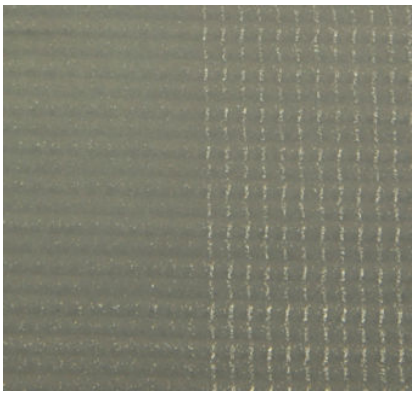
  To correct the substrate advance, see Substrate-advance compensation on page 128. In most cases, this will solve the problem. However, you are recommended to run the OMAS Diagnostic Tests from the maintenance window as soon as the substrate is unloaded, to avoid having the same problem with other substrates. See Clean the substrate-advance sensor on page 185.
- **Printhead-to-belt spacing.** Check the printhead-to-substrate spacing in the Internal Print Server. If it is higher than normal, try reducing it.

Graininess

The print shows a higher level of grain than expected, either throughout the print or in some specific areas. The example below shows more grain in the lower half than in the upper half.

This can occur for various different reasons:

- **Coalescence.** Some substrates, in some particular conditions, can produce a type of grain due to wetting issues. For example, in high humidity or low temperature environments, the ink may not dry fast enough in fast print modes, producing a grainy effect on the print. The example below shows worse coalescence on the right-hand side.



It is difficult to decide whether this kind of problem is due to wetting or to dot placement error (described below). The type of grain could be a clue: in the case of wetting issues, dots tend to aggregate into bigger dots, with empty spaces in between. A magnifying glass can be useful to examine the print in more detail.

Here are some tips for solving this problem:

- Increase the optimizer level.
- Increase the drying temperature.
- Increase the number of passes.
- Minimize the printer-to-belt distance.

- **Printhead alignment.** This is a clear contributor to grain. If printheads are not correctly aligned, the misplaced dots could correlate directly with the severity of the graininess.

  To check printhead alignment, print the printhead alignment diagnostics plot (see Printhead alignment diagnostics plot on page 121). As a general rule, the biggest contributors to grain caused by printhead alignment are (in this order):

  - Bidirectional alignment
  - Inter-color alignment (alignment between different colors)

  Here is a tip for solving this problem:

  - If the printhead alignment was done with a different substrate of different thickness, probably a new printhead alignment is needed.

- **Substrate advance.** Before trying to adjust any parameter, make the following checks:

  - Check that no substrate-advance factor was set earlier that could prevent the substrate-advance sensor from working correctly.
  - Run the diagnostics to check that that the substrate-advance sensor is not dirty.

  Grain in a print can be increased by incorrect substrate advance, due to mispositioning of the dots.

  To check the substrate advance, go to the Internal Print Server and tap **Printer** > **Advance Calibration**. See Substrate-advance test print on page 128.

  To correct the substrate advance, see Substrate-advance compensation on page 128. In most cases, this will solve the problem. However, you are recommended to run the OMAS Diagnostic Tests from the maintenance window as soon as the substrate is unloaded, to avoid having the same problem with other substrates. See Clean the substrate-advance sensor on page 185.

- **Substrate wrinkles.** If you see patches of high grain in some local areas of the print, this could be caused by wrinkles in the substrate. See There are wrinkles and ink smears on the substrate on page 240.

- **Color usage.** In general, 4-color printing produces more grain than 6-color printing. Printing without a proper ICC profile can also increase grain, especially if the use of black is increased in the profile.
- **Local graininess** can be caused by wrinkles in the substrate.
- **Not enough passes**. Increase the number of passes.

Physical deformation marks

You may occasionally see physical deformation of the substrate. This issue is not a mispositioning of the dots, but a physical deformation of the substrate that usually occurs after the dots have been printed. There are various kinds of deformation that may occur:

- Belt marks on the underside of the substrate, due to excessive heat.
- Deformation of flexible substrate, due to wrinkles induced by curing.

Both kinds of deformations can be the result of an excessive curing temperature. See There are physical marks on the substrate on page 238.

Poor curing

When the heat applied to the printed substrate is not enough for the quantity of ink laid down, the print may appear wet or with some gloss marks. The heat needed to cure is directly dependent to the combination of: ink density, time under the curing module (printmode), curing temperature, airflow, and drying power. These are the defects you may see:

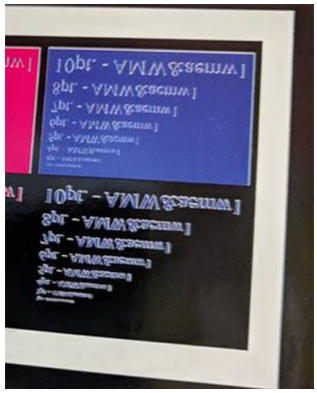
- **Perforated plate gloss marks:** The print suffers from an added matte pattern over the areas with more ink density. You can see small circles scattered over the picture with different levels of gloss.

- **Wet print:** The ink comes out of the curing module not perfectly dry, and in severe cases the ink can be smudged by touching it.

Here are some tips for solving both problems:

- Repeat the Add New Substrate procedure in case you had wrong settings in the substrate preset. Check curing-to-substrate distance, curing temperature, and airflow.
- Increase the curing temperature and/or airflow.
- Decrease the ink density.
- Reduce throughput.

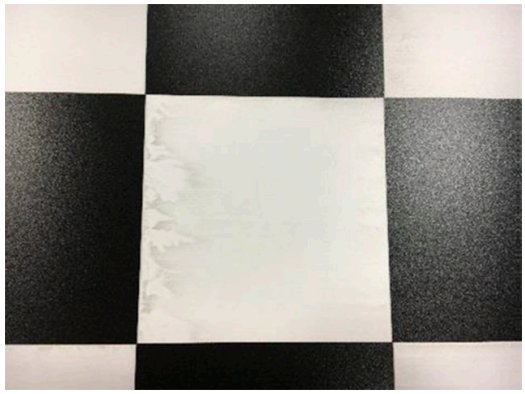
White-to-color misalignment



In some white-ink applications, the white ink may be seen at the edges of the image. If this happens:

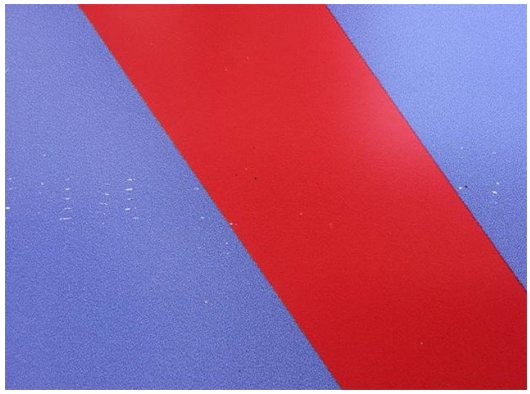
1. Check printhead alignment, and realign if necessary.
2. Shrink the white plane in the RIP software, or use the choke option: see Choke functionality on page 280.

Static electricity



Some substrates have high electrostatic charges because of their liners, and they attract aerosol and dirt while printing. In this case, it helps to clean the substrate with a general-purpose industrial cleaner (such as Simple Green) before printing.

Dual-side marks



You may see marks on some substrates when printing on the other side. This can be due to dirt on the belt (see Clean the substrate-advance belt on page 154) or a small curing margin. If the problem persists after cleaning the belt, try the following suggestions:

1. Increase the amount of overcoat.
2. Increase the curing temperature.

3. Decrease the amount of ink.
4. Increase the number of passes.
5. Wait several hours before printing on the other side.

13 Troubleshoot ink cartridge and printhead issues

- Ink cartridges
  - Cannot insert an ink cartridge
  - The Internal Print Server does not recognize an ink cartridge
  - The Internal Print Server recommends replacing or reseating an ink cartridge
  - Bent ink cartridge connector
- Printheads
  - Cannot insert a printhead
  - The Internal Print Server recommends replacing or reseating a printhead
  - Printhead health troubleshooting
  - New printhead is rejected
  - Automatic printhead alignment fails
- Printhead cleaning roll errors

Ink cartridges

Cannot insert an ink cartridge

1. Check that the cartridge (type and capacity) is the correct one for the printer. See http://www.hp.com for the latest information on printer supplies.
2. Use the correct procedure to change ink cartridges, through the Internal Print Server. See Remove an ink cartridge on page 89.
3. Check that there is no obstruction in the ink cartridge connector.
4. Check that the ink cartridge is of the correct color. A connector will refuse to connect to a cartridge of the wrong color.
5. Check that the ink cartridge is correctly oriented (compare with the others).

The Internal Print Server does not recognize an ink cartridge

1. Ensure that you have inserted the cartridge correctly and fully. You should hear a click.
2. Ensure that the tabs on each side of the cartridge connector are opened but in place, showing a successful connection.
3. If the problem persists, check the ink cartridge connector (see Bent ink cartridge connector on page 261).
4. If the problem still persists, call your service representative.

The Internal Print Server recommends replacing or reseating an ink cartridge

1. Disconnect the ink cartridge.
2. Reconnect the ink cartridge and check the Internal Print Server message.
3. If the problem persists, check the ink cartridge connector (see Bent ink cartridge connector on page 261).
4. If the problem persists, insert a new ink cartridge.
5. If the problem still persists, call your service representative.

Bent ink cartridge connector

You may find that the ink cartridge connectors have become bent while the cartridge was disconnected (see Remove an ink cartridge on page 89). This means that they cannot connect properly, and you will see a reseat message.

To correct this problem, use pliers to straighten the connectors so that they will fit into their slots.

Printheads

Cannot insert a printhead

1. Check that you are inserting the printhead into the correct slot.
2. Use the correct procedure to change printheads, through the Internal Print Server. See Remove a printhead on page 93 and Insert a printhead on page 95, bearing in mind the special tips for the optimizer printhead.
3. Check that there is no obstruction in the printhead slot.
4. Check that the printhead is correctly oriented (compare with the others).

The Internal Print Server recommends replacing or reseating a printhead

General recommendations

1. Remove the printhead.
2. Reinsert the printhead into the carriage and check the Internal Print Server message.
3. If the problem persists, check the printhead contacts for dirt or aerosol and clean them if necessary. See Clean the printhead contacts on page 200.
4. Find more troubleshooting information in the following sections, Problem due to overheating on page 262 and Problem due to the primer system on page 262.
5. If the problem persists, insert a new printhead.
6. If no printhead works in that slot, call your service representative.

Problem due to overheating

A printhead may overheat for several reasons:

- The room temperature may be too high.
- The printhead may be suffering from blocked nozzles. You may be able to cure this problem by cleaning the printheads (see Check and clean the printheads on page 97).
- The printhead may be faulty, in which case it should be replaced.

Problem due to the primer system

Primers are important to the printheads' nozzle health. When there is a problem with a primer, the Internal Print Server displays the following messages.

During a printhead replacement

- A reseat message for a particular printhead
- A printhead replacement incomplete message
- A numerical error code starting with 0088 (for colour primers) or 1088 (for white primers): 0088-00XX-YYZZ or 1088-00XX-YYZZ

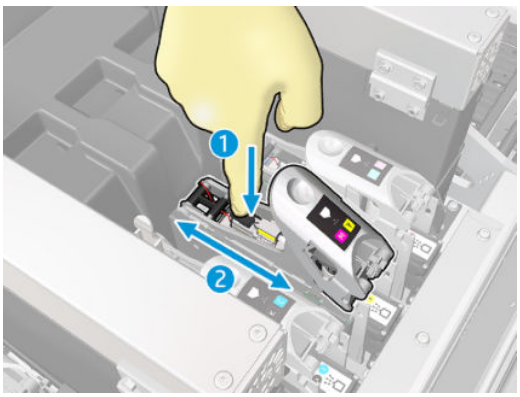
During a printhead servicing routine

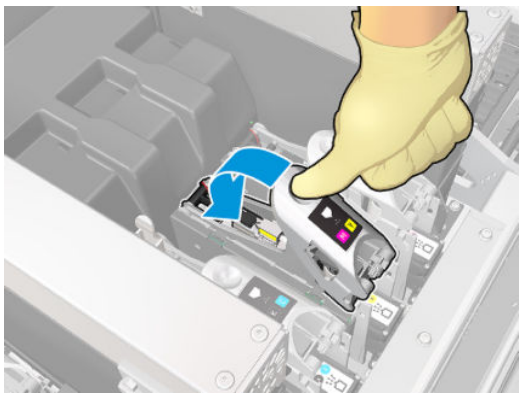
- A reseat message for a particular printhead
- A numerical error code starting with 0088 (for colour primers) or 1088 (for white primers): 0088-00XX-YYZZ or 1088-00XX-YYZZ

The message **0088-0001-0Y41 – Primer 0Y leakage detected** (or 1088-0001-0Y41 for white primers) indicates that one of the primer systems leaks. The number 0Y indicates which primer is leaking, where Y ranges from 1 to 6 for colour primers and from 1 to 2 for white primers.

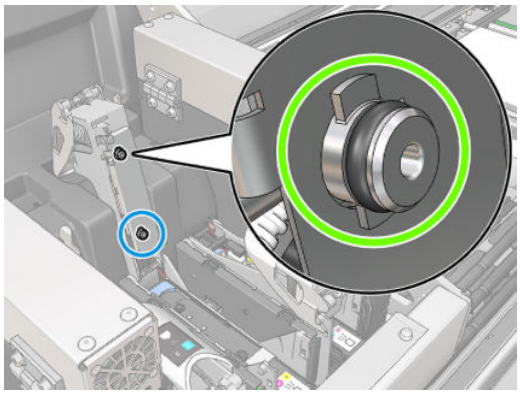
You are recommended to:

- Run the primer diagnostic test from the diagnostics window to confirm the cause of the error.
- Reseat the printhead. Make sure to push the primer into position before securing the latch. While running the test, you will already have done it at least once.





- Check that the O-rings in the primer ports are not broken or damaged. Replace the primer if any O-ring is missing or dented.



- Grease the printhead primers. See Grease the printhead primers on page 208.

If none of these actions resolve the problem, call your service representative.

If you see any other primer-related system error (0088-00XX-YYZZ or 1088-00XX-YYZZ) run the primer diagnostic test from the diagnostic widget to confirm the cause of the error, and call your service representative with the test results at hand.

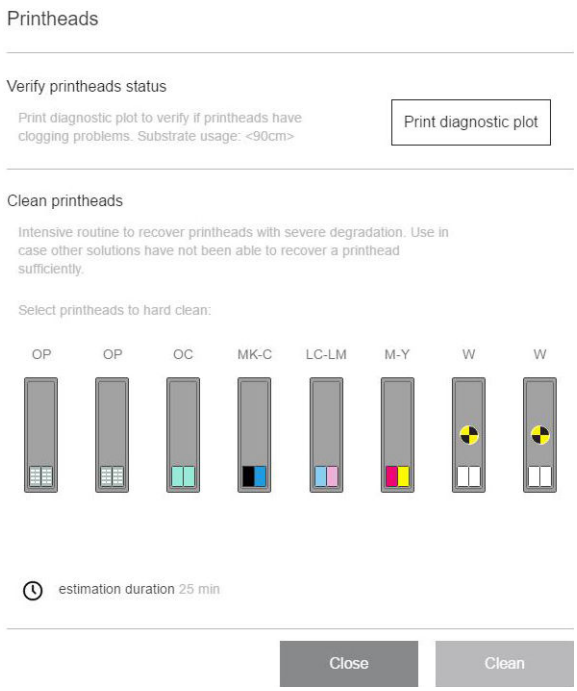
Printhead health troubleshooting

There are two ways to check the status of the printheads: the printhead status plot and the nozzle health check in maintenance. Always use both, as they provide complementary information. They identify any blocked printhead nozzles.

Printhead status plot

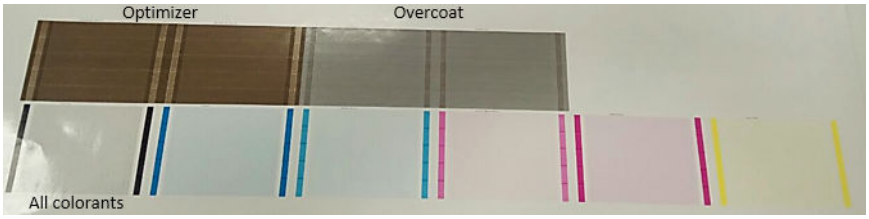
You are recommended to print this plot on a transparent flexible substrate. Otherwise, the colors may not be sufficiently visible.

To print the printhead diagnostic plot, go to the Internal Print Server and tap **Printheads replace** > **Hard clean** > **Print diagnostic plot**.

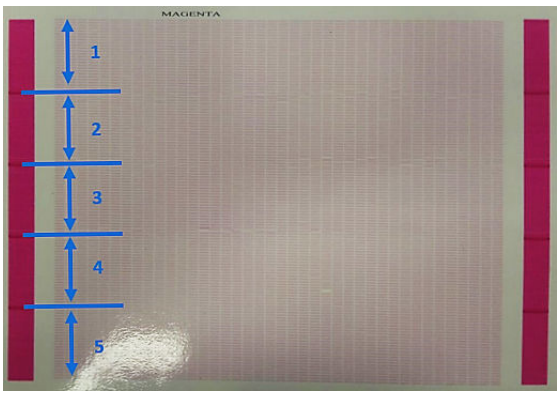


The printer detects whether a white printhead is installed, and (depending on that) prints a plot with or without white ink and the second optimizer.

If there is no white printhead, the following image is printed.

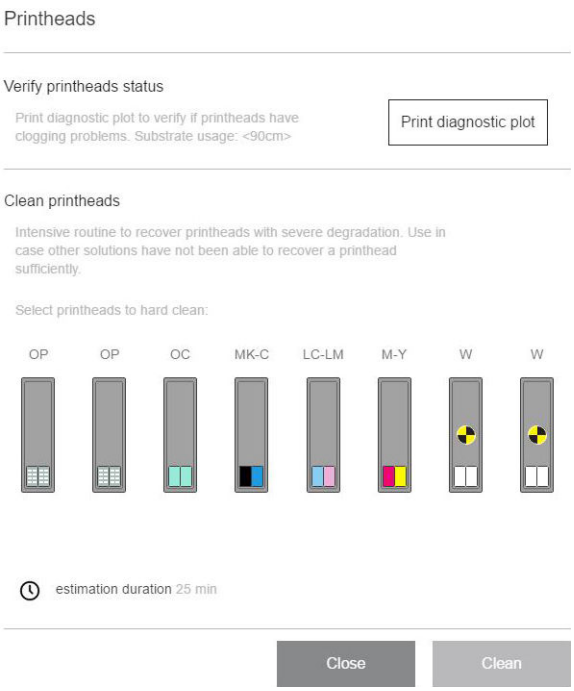


One pattern shows plainly which nozzles in each printhead are printing and not printing. For reference, each one of the five areas (square in the picture and 1 to 5) of each color corresponds to approximately 1000 nozzles.



Hard clean

To perform a hard cleaning routine, go to the Internal Print Server and tap **Printheads replace** > **Hard clean**, select the printhead(s) to clean, and tap the **Clean** button.



Sometimes, when the printhead fails to respond to treatment, running the hard-clean routine twice helps to recover its performance.

Drop detector diagnostics

Execute the drop-detector diagnostics from the diagnostics window. This will identify blocked nozzles in each printhead.

Decision table

The following table summarizes the data that can be seen in each diagnostic, the possible causes, and the decisions.

Nozzle health	Drop detector	Possible cause	Action
< 300 blocked (all colors)	< 300 blocked (all colors)	Other	Continue banding troubleshooting.
< 300 blocked (all colors)	< 300 blocked (all colors)	Substrate advance, or other	Check the substrate-advance sensor. Continue banding troubleshooting.
< 300 blocked (that color)	< 300 blocked (that color)	Other	Continue banding troubleshooting.
> 300 blocked	> 300 blocked	Printhead failure	Hard-clean the printhead, twice if necessary. Replace the printhead.
< 300 blocked (at least one color)	> 300 blocked (at least one color)	Drop detection failure	Call your service representative.

New printhead is rejected

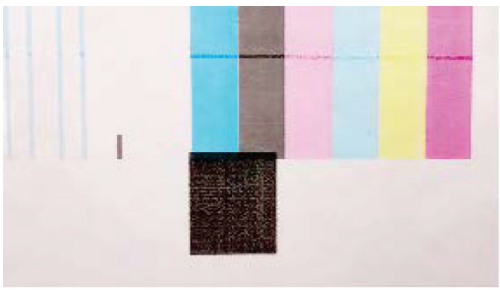
If the printer will not accept a new printhead, try the following steps in sequence:

1. Ensure that the printhead was correctly stored in its orange cap.
2. Ensure that the electrical contacts are clean.
3. Run the primer system diagnostic.
4. Assume that the printhead is faulty, and try another one.
5. If no printhead works in that slot, call your service representative.

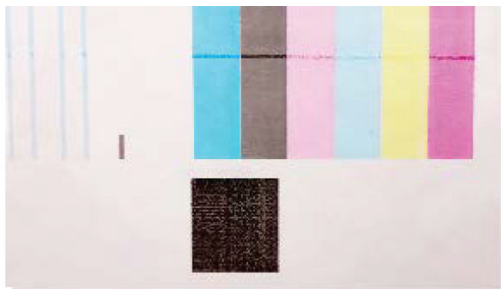
Automatic printhead alignment fails

Automatic printhead alignment may fail occasionally. You may see the alert **Automatic Printhead Alignment canceled because of scanning errors**, which can be caused by different problems:

- The scans of the printed blocks cannot be performed reliably on the current substrate. The scans of the patterns maybe unreliable or impossible on substrates that are non-white, transparent, or translucent, or have a very rough or punched surface. For these substrates, automatic printhead alignment using the built-in line sensor may not be possible.
- Some patterns of the automatic printhead alignment plot are defective due to:
  - Stains or printhead crash marks on the substrate that can be easily seen by visual inspection of the three blocks in the plot. Make sure the substrate has no stains before running automatic printhead alignment.
  - Printhead crash marks may occur when the substrate is wrinkled. See There are wrinkles and ink smears on the substrate on page 240
  - Generally poor print quality due to clogged nozzles. See Check and clean the printheads on page 97.
- Either the built-in line sensor is not working properly or is not well calibrated. Automatic printhead alignment uses the black colorant as reference to align the rest of colorants, therefore the line sensor has a specific calibration that saves the proper distance between the line sensor and the black printhead (see Diagnostics on page 234). If the LsToK (line sensor to black) calibration is not done, it can be seen by a visual inspection of the plot. In this case, the black patch is overlapping the spitbars of the first block of patterns, shown here:



Incorrect calibration of LstoK



Successful calibration of LsToK

If the problem persists, call your service representative.

Printhead cleaning roll errors

You should not touch the printhead cleaning roll except when you need to replace it.

When the printhead cleaning roll reaches its end, it should be replaced. Always do this by following the Internal Print Server wizard. See Replace the components of the printhead cleaning roll kit on page 98.

Any handling of the roll may prevent the printer from keeping track of roll usage, in which case you may see spurious error messages, and a printing job may be canceled unnecessarily.

14 Troubleshoot other issues

- The printer does not start
- The printer does not print
- The printer cannot be restarted from the Internal Print Server
- The printer seems slow
- Request to reinitialize the carriage
- The Internal Print Server cannot detect the printer
- Color calibration fails

The printer does not start

1. Check that the power supply to the printer is working.
2. Check that the main power switch and PC switch are both on.
3. Check that the main power lights are on and the circuit breakers are all up.
4. Check that the IPS is working with no alerts showing.
5. Try turning the main switch off (not the PC switch) and turning it on again after 10 seconds.
6. If any of the circuit breakers trip (from up to down) while the printer is operating, switch off the printer and call your service representative.

The printer does not print

If all is in order (substrate loaded, all ink components installed, and no file errors), there are still reasons why a file you have sent from your computer may not start printing when expected:

- You may have an electrical power problem. If there is no activity at all from the printer, nor from its built-in computer, check that the power cables are connected correctly and that there is power available at the source.
- You may be experiencing unusual electromagnetic phenomena, such as strong electromagnetic fields or severe electrical disturbances, which can cause the printer to behave strangely or even stop working. In this case, turn off the printer, wait until the electromagnetic environment has returned to normal, then turn it on again. If you still experience problems, call your service representative.

The printer cannot be restarted from the Internal Print Server

In rare cases, the printer may be unresponsive to the **Shutdown** and **Wake up** buttons. If this happens, turn off the main switch, then turn it on again after 10 seconds and restart the built-in computer.

The printer seems slow

You may experience a temporary delay while the printer's drying and curing modules are warming up.

In some circumstances, the printer will deliberately print more slowly than usual to prevent the printheads from overheating. There are several possible reasons why a printhead may start to overheat:

- The room temperature is too high.
- The printhead is suffering from blocked nozzles (see Check and clean the printheads on page 97).
- The printhead is faulty and should be replaced.

Request to reinitialize the carriage

In some cases you may be asked to reinitialize the carriage. This operation restarts some mechanical subsystems, avoiding the need to restart the whole printer.

The Internal Print Server cannot detect the printer

If the Internal Print Server cannot establish communication with the printer, without apparent reason or after modifying Windows properties, follow these steps:

1. Use the **Wake up** button in the **Tools** menu to try to reactivate the printer.
2. Turn off the printer's main switch, then turn it on again after 10 seconds and restart the built-in computer.
3. Check the cable connecting the built-in computer to the printer.
4. Check that the Internal Print Server is correctly set up.
5. Contact your service representative.

Color calibration fails

Automatic color calibration may fail occasionally. You may see the alert **Color calibration canceled because of scanning errors**, which can be caused by various different problems.

- Reflective color measurements of the printed target cannot be performed reliably on the current substrate. Reflective color measurement can be unreliable or impossible on substrates that are non-white, transparent or translucent, very glossy, or have a very rough or punched surface. For these substrates, automated color calibration using the embedded spectrophotometer may not be possible.
- Some of the color measurements of the color calibration test chart are defective due to:
  - Stains or printhead crash marks on the substrate, that can be easily seen by visual inspection of the printed chart. Make sure the substrate has no stains before running color calibration. Printhead crash marks may occur when the substrate is wrinkled. See There are wrinkles and ink smears on the substrate on page 240.
  - Wrinkles or bubbles in the substrate, even when there has been no printhead crash.
  - Generally poor print quality (such as banding). See Troubleshoot print-quality issues on page 243.
- Either the embedded spectrophotometer or the line sensor is not working properly. If the problem persists, call your service representative.

15 When you need help

- Open a support case at HP PrintOS
- If you are not registered with HP PrintOS
- HP Proactive Support
- HP Customer Care

Open a support case at HP PrintOS

If you accepted the invitation to HP PrintOS sent to you during the installation of your printer, and if HP Proactive Support is enabled in your printer, you can open a support case at http://www.printos.com. The information about your case will already be in the HP support system, simplifying and accelerating the support activity.

If you did not accept the invitation to HP PrintOS while installing the printer, you can register it now at http://www.printos.com.

If you are not registered with HP PrintOS

If the support for your printer is provided by a HP Service Authorized Partner, that is your contact when requesting help. Otherwise, please contact HP Support, which is available by telephone or email.

Please have your serial number, product number, and contact details ready.

HP Proactive Support

HP Proactive Support helps reduce costly printer downtime by preemptively identifying, diagnosing, and resolving printer issues before they become problems for you. HP's Proactive Support tool is designed to help businesses of all sizes reduce support costs and maximize productivity—all with a tap on the screen.

A component of the HP Imaging and Printing suite of services, Proactive Support helps you gain control of your printing environment—with a clear focus on maximizing the value of your investment, increasing printer uptime, and reducing printer management costs.

HP recommends that you enable Proactive Support right away to save you time and prevent problems before they occur, reducing costly downtime.

You can enable Proactive Support in the Internal Print Server by tapping **Preferences** > **Connectivity** > **Remote assistance**.

If Proactive Support finds any potential problem, it notifies you. In some cases, the solution may be applied automatically; in other cases, you may be asked to perform some procedure to solve the problem.

HP Customer Care

HP Customer Care offers award-winning support to ensure you get the most from your printer, providing comprehensive, proven support expertise and new technologies to give you unique end-to-end support. Services include setup and installation, troubleshooting tools, warranty upgrades, repair and exchange services, phone and Web support, software updates, and self-maintenance services. To find out more about HP Customer Care, visit us at:

http://www.hp.com/go/graphic-arts/

16 Accessories

- White upgrade kit
  - White printhead maintenance wheel
  - Auxiliary white printhead insertion process
  - Preparing a white job in your design software
  - Preparing the job in the RIP
  - Printing a white job from the Internal Print Server
  - Choke functionality
  - White ink maintenance operations
- Roll printing kit
  - Load flexible substrates with table-top roll holder
  - Hold-down plate
    - How to use the hold-down plate
    - Maintenance tasks
- Extension tables
- Disposal instructions

NOTE: Depending on your country, there may be bundled configurations of accessories with the printer.

White upgrade kit

http://www.hp.com/go/latexRseries/white_ink

The white upgrade kit provides the option of printing with white ink, which is useful mainly when printing on non-white substrates, such as dark, colored, metallic, or transparent substrates. The following basic design techniques may be used:

- **Underflood:** A solid rectangle (or irregular shape) of white ink is printed and cured, then a colored image is printed on top of it. When used on a non-white or reflective surface, this can provide better color saturation or allow colors that are similar to the substrate color to be visible.
- **Overflood:** A colored image is printed and cured, then a solid rectangle (or irregular shape) of white ink is printed on top of it. This is most often done with transparent substrates to create a sign that is viewed on a light box (for example, a shopping mall map, airport advertisement, or bus stop signage). When viewed from the opposite side of the substrate on which it was printed, the image must be reversed (mirrored) in the RIP or application software before printing.
- **Spot:** Any white shape (including text) that is cured with and in the same plane as the rest of the artwork, rather than in a separate plane or layer. In conventional (analog) offset or screen printing, this might be called a *knockout*, because none of the colors are overprinted.
- **Sandwich mode:** A white layer is embedded between two different images, allowing a different image to be seen on each side of the shape.

White printheads need manual cleaning periodically, in addition to the automatic servicing that all printheads receive.

IMPORTANT: White ink cartridges, and either white printheads or auxiliary white printheads, should remain permanently installed, even if you are not currently using white ink in your jobs. The white recirculation requires a minimum level of ink in the cartridge to maintain the white system.

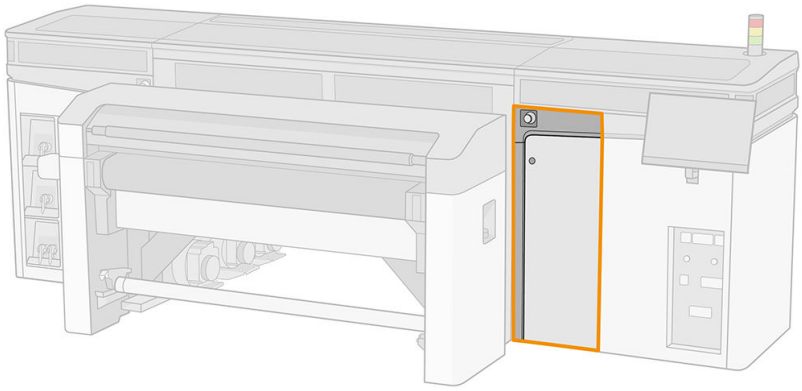
NOTE: When printing a CMYK or CMYKcm image without a white under-fill on non-white substrate, color saturation may be reduced, depending on the color of the substrate.

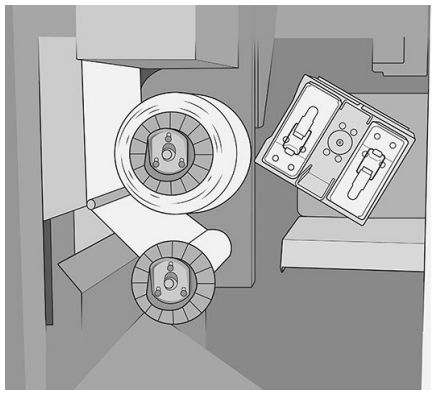
NOTE: White ink has a maximum shelf life of 7 months from the date of manufacture.

NOTE: White ink has a tendency to settle over time.

White printhead maintenance wheel

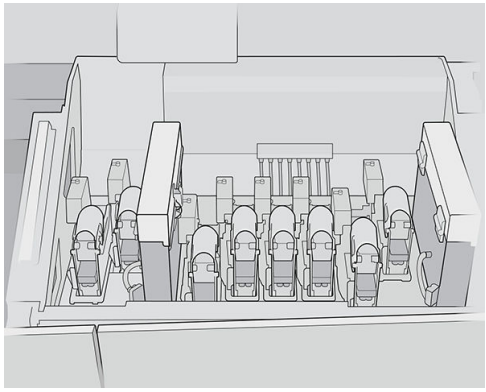
The white printhead maintenance wheel allows you to extend the life of white printheads when they are not being used. The wheel is located close to the printhead cleaning roll.





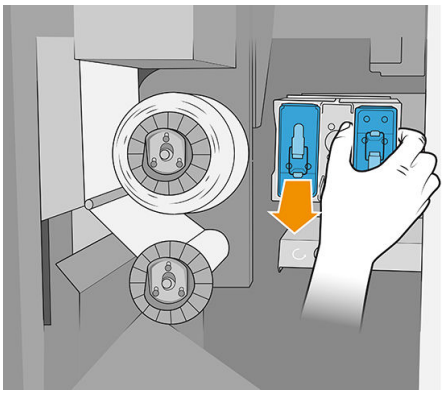
IMPORTANT: If you do not intend to use white ink, you should remove the white printheads and store them in the maintenance wheel. Otherwise some white ink will be wasted during routine maintenance.

1. Ensure that the printer is not trying to print: stop the job queue.
2. At the front panel, tap **Replace** in the Printheads section of the Internal Print Server's main window.
3. Remove the two white printheads from the carriage.

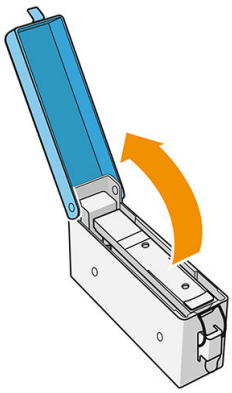


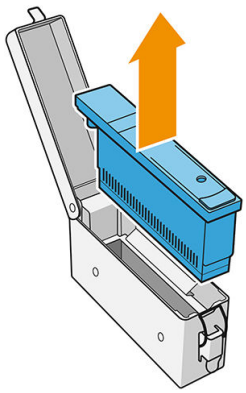
4. Check the bottoms of the white printheads. If you see some ink (which can happen because of the automatic recirculation), clean them gently with a soft cloth and distilled water.

5. Remove the two printhead storage boxes from the wheel.



6. Open each storage box and remove the auxiliary white printhead from it.

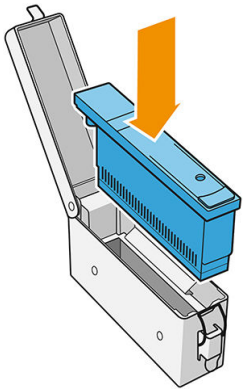




7. Check the bottom plate of each white printhead. If there is some ink on it (which can happen because of the automatic recirculation), clean it gently with a soft cloth dampened with distilled water.

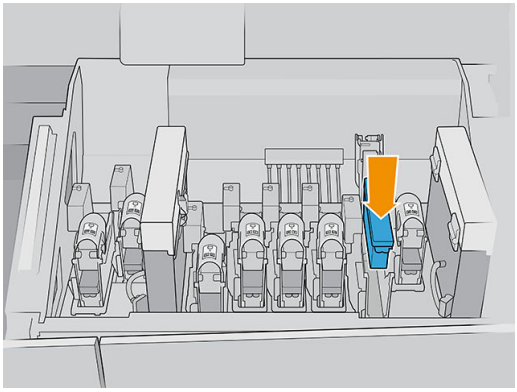
8. Put the white printhead into the appropriate storage box, then put the storage box back into the wheel.

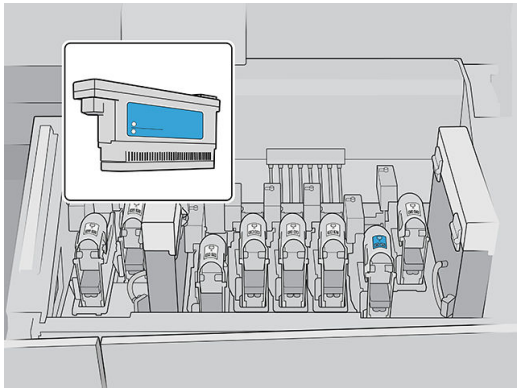
IMPORTANT: The storage boxes are labelled. Be careful to put the white printhead into the box with the white label.



9. Insert the auxiliary white printhead into the carriage in place of the white printhead.

IMPORTANT: Be careful to put the auxiliary white printhead into the slot in the carriage with the white label.



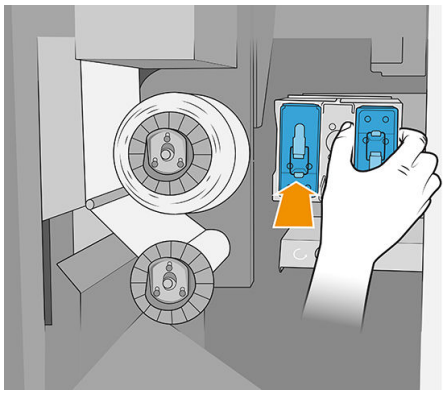


IMPORTANT: Do not try to print without a full set of printheads installed in the carriage.

IMPORTANT: If any component from the white upgrade kit is broken, or if a white cartridge is empty, the recirculation process could be affected. You are recommended to replace these components promptly when necessary.

10. When both storage boxes containing white printheads are in place in the wheel, press the button to start the wheel.

NOTE: In case you forget to turn on the wheel, it is programmed to turn itself on after a while.



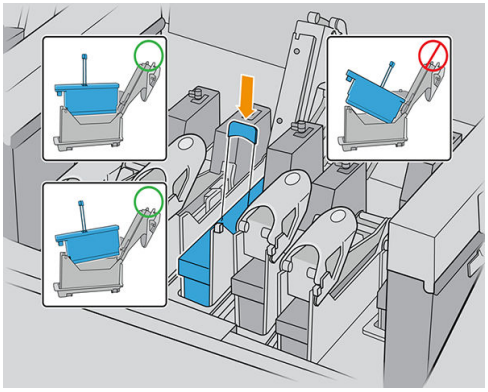
You can leave the white printheads in the maintenance wheel for as long as you like.

To use them again, reverse the above procedure.

IMPORTANT: The printer should never be turned off while the white upgrade kit is installed. See Turn the printer on and off on page 18.

Auxiliary white printhead insertion process

The insertion and removal of the auxiliary white printhead should be done in the same way as for a regular printhead. That is, it should be inserted vertically, in the same direction as the fluid interconnect. That will avoid damage to the printhead and to the printer.



Preparing a white job in your design software

Prepare the job using layers. Before sending it to the RIP, you should ensure that the part of the image to be printed in white is on a separate layer named “Spot1”: a name that the printer will recognize.

If you send the image with no white layer, the printer will fill the whole surface with white.

When the image is ready, send it to the RIP.

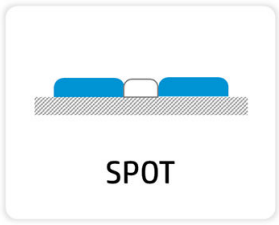
Preparing the job in the RIP

In the RIP, choose the desired print mode. This selection places the white layer defined in the application into its desired position: Over, Under, or Spot (at the same level as the color layers). Assigning a print mode with white ink to a job with no white layer will cover the whole printing area with white. When ready, send the job to the printer.

The selectable options and their effects are as follows.

Overflood: The white layer is printed on top of the color layer, enabling you to create new colors by playing with white ink translucency. This is used to print on transparent substrates such as acrylic, transparent film, or glass.

Underflood: White ink is printed on the substrate, enabling you to print color on top of a non-white or translucent substrate.



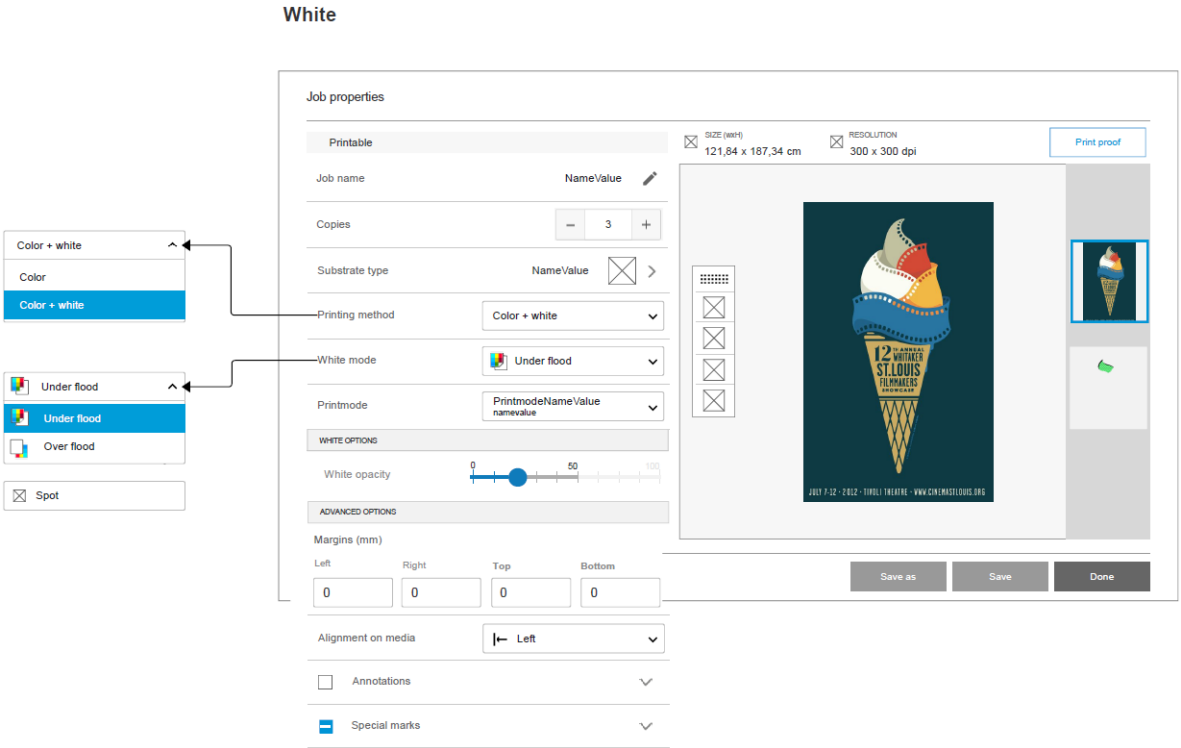
Spot: White ink is printed in the same way as any other color.

Sandwich: A white layer is embedded between two different images, allowing a different image to be seen on each side of the shape.

Printing a white job from the Internal Print Server

Once the job has reached the printer, you can treat it like any other job.

If you like, you can look at the job properties to find out what selection was made in the RIP for the white ink, and perhaps change it. This will override the decisions made in the RIP and relocate the white layer to your newly chosen position.



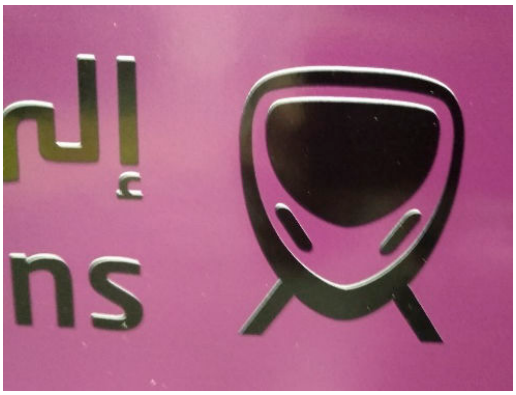
You can also create some effects in a job that arrived without a white layer, or you can retrieve the white layer from a job.

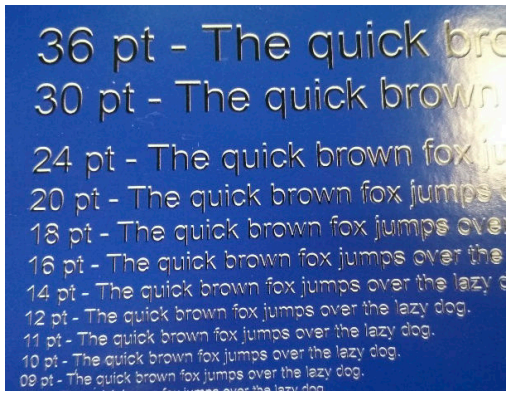
Sometimes white ink behaves unexpectedly with some substrates. It may, for example, spread beyond its assigned borders. You can apply a slight modification to the white layer by activating the Spread and Choke option, reducing or expanding the borders of the white area to counter the effect.

SPREAD & CHOKE

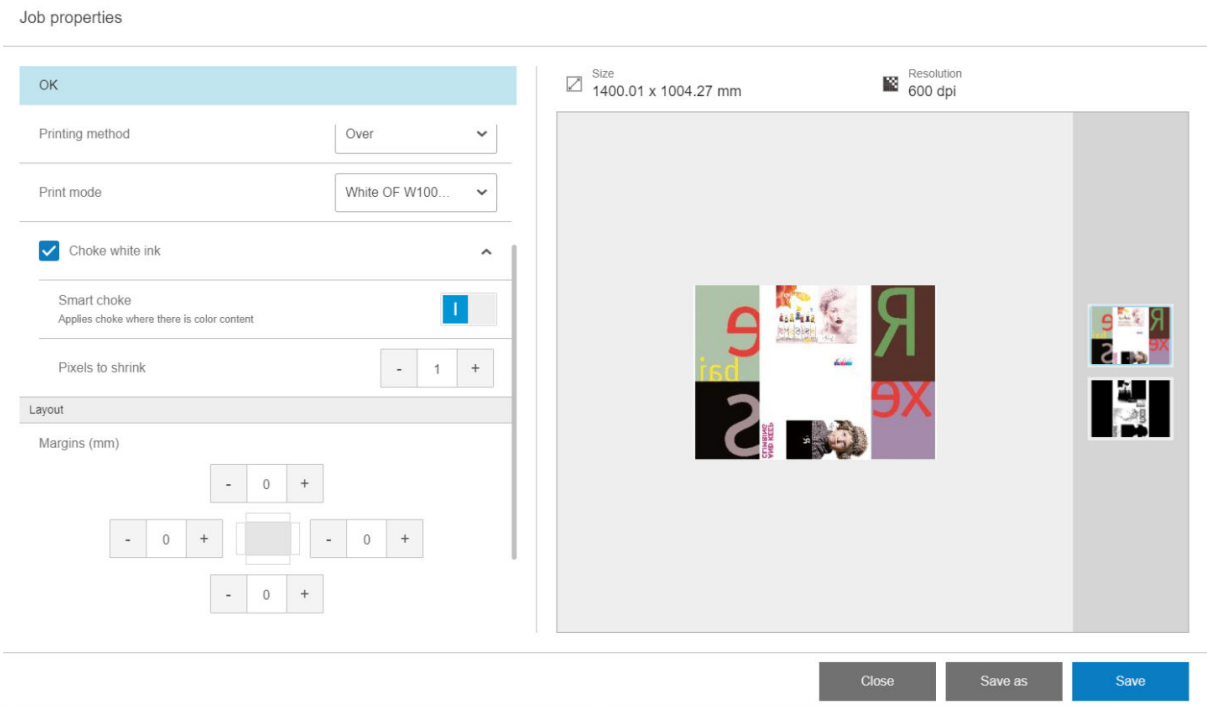
Choke functionality

Choke is used to shrink the white layer if there is a misalignment between the color layer and the white layer in the printed output, such as in the examples below.





If required, choke can be selected from the Job Properties panel.



There are three separate settings:

- Choke white ink

- If disabled (the default), choke is not applied, and the following two settings are inapplicable.
- If enabled, choke is applied: some pixels are removed from the white layer.

- **Smart choke**
  - If disabled (the default), choke is applied to the whole white layer. Some small details may disappear.
  - If enabled, choke is applied only to parts of the image where there is color above or below the white layer, and small details are protected.
- **Pixels to shrink**

  The number of pixels to be removed from the white layer. HP recommends starting with 4 pixels (at 600 dpi) and adjusting the amount if necessary.

NOTE: The number of pixels to be removed is related to the image resolution: so 4 pixels at 600 dpi is equivalent to 2 pixels at 300 dpi.

White ink maintenance operations

See Summary of maintenance operations on page 135.

Roll printing kit

The roll printing kit permits printing on rolls of flexible substrate, using two spindles for long jobs, or the table roll holder for shorter jobs. It supports prints up to 10 m (32 ft 10 in) in length.

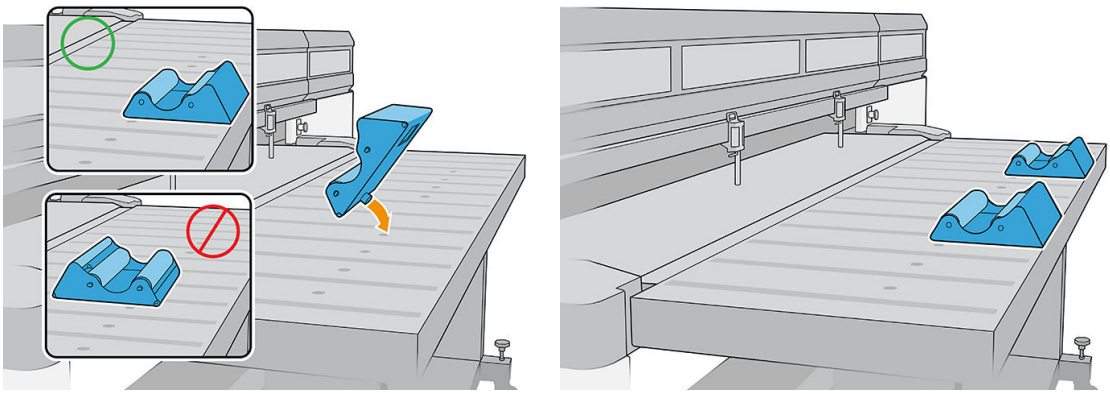
To load with two spindles, see Load flexible substrate on page 53.

Load flexible substrates with table-top roll holder

If the optional flexible-substrate supply and takeup system with table-top roll holder is installed on the printer, you can print on flexible substrates in the following way.

CAUTION: Flexible substrates are supported up to a maximum width of 1.63 m (64 in), a maximum length of 10 m (32 ft 10 in), and a maximum weight of 20 kg (44 lb). See also Supported HP flexible substrates on page 329.

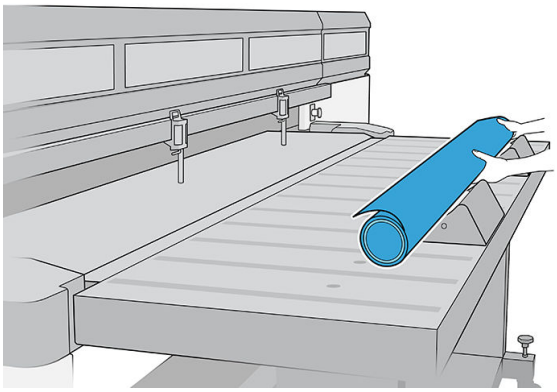
1. If installed, detach the rigid-substrate output table from the printer, and set it aside.
2. Ensure that the input extension table is correctly installed. See Extension tables on page 287.
3. Install the table-top roll holders into the holes on the input table, allowing the substrate to be loaded centered on the printer.



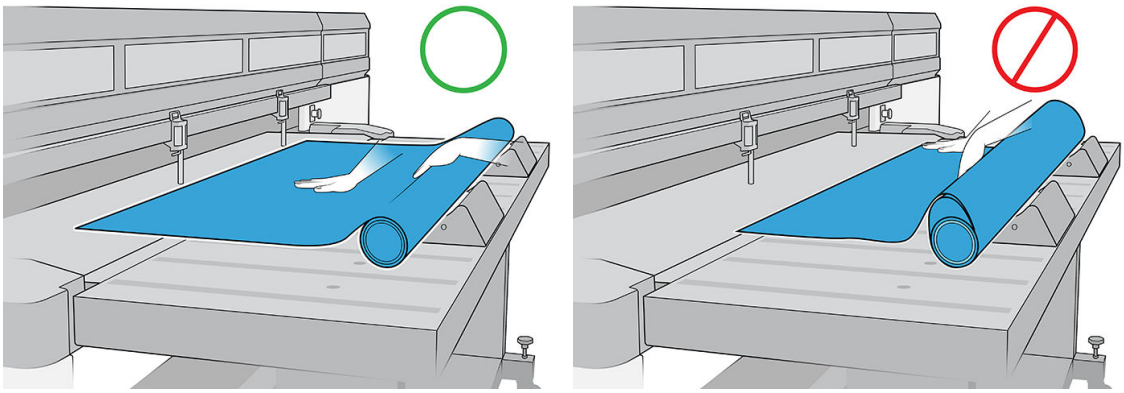
4. Load the substrate onto the table-top roll holder, spooling off the top, with the substrate centered.

NOTE: The table-top roll holder supports only print-side out.

NOTE: To prevent fingerprints from showing on printed output, wear gloves while handling the substrate.



IMPORTANT: Ensure that the roll is free from telescoping and sag.

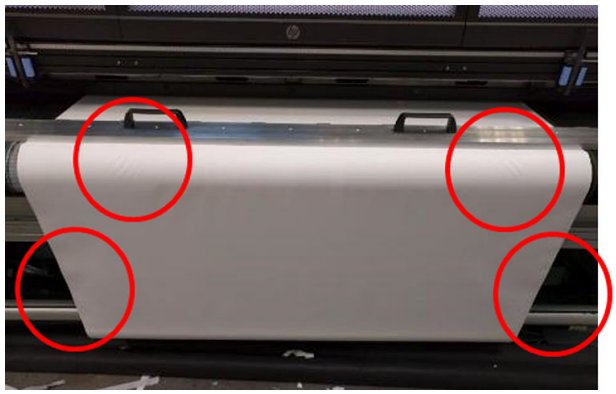


5. Move the substrate forward until it reaches the alignment bar.
6. Use the Internal Print Server to configure the substrate as explained in Substrate configuration on page 43. At the end of the configuration process, tap **Sheet ready**.

Hold-down plate

Wrinkles in the substrate can cause printhead crashes. The hold-down plate is a device to prevent such wrinkles from entering the print zone.

The occurrence of wrinkles may vary from one roll to another; they can be caused by the manufacturing process or the bagginess of the substrate.



HP recommends using the hold-down plate for the following substrate types, especially with wide rolls:

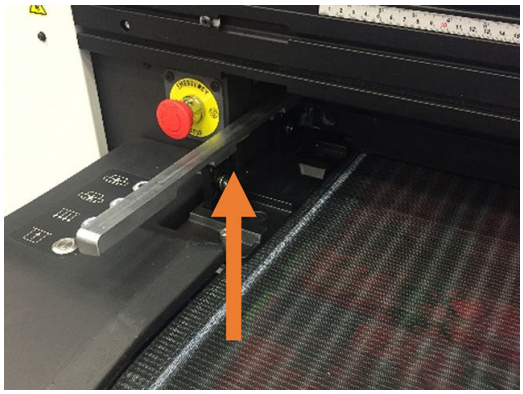
- PVC banner
- Paper
- Canvas
- Others

How to use the hold-down plate

You must keep the hold-down plate above the central top cover of the printer.

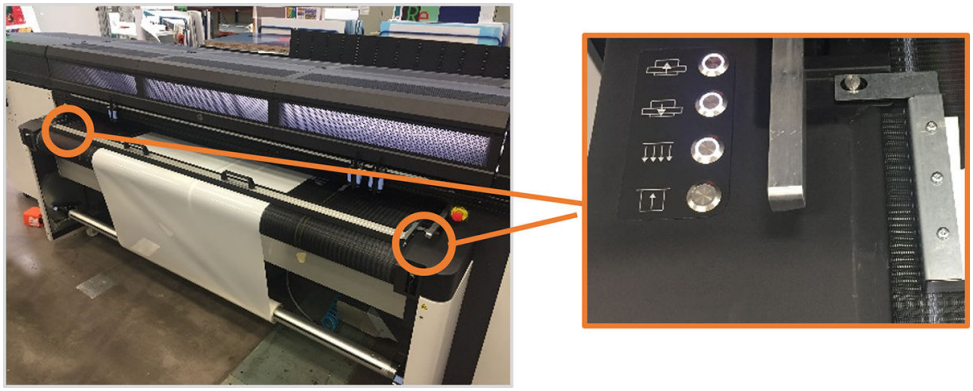
1. Load the substrate.

2. Lift up the side alignment bars on both sides.



3. Put the hold-down plate over the substrate.

4. Ensure that the pins fit into the holes at the edges of the brackets.



5. Print as usual.

Maintenance tasks

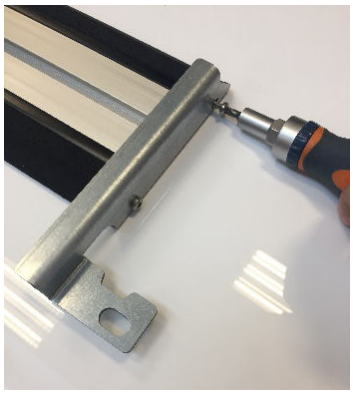
Velvet replacement

After some use, the hold-down plate velvet may become damaged or worn, possibly leaving marks on the printed side of the substrate.

Replace the velvet

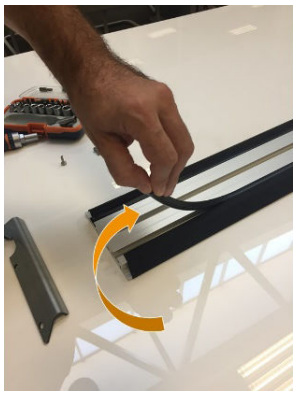
1. Place the hold-down plate on a flat surface.

2. Remove one of the side brackets, using a T20 screwdriver.



3. Remove the black slot covers that fix the velvet to the beam.

TIP: You can use a flat screwdriver for this operation.



4. Remove the velvet from the beam.

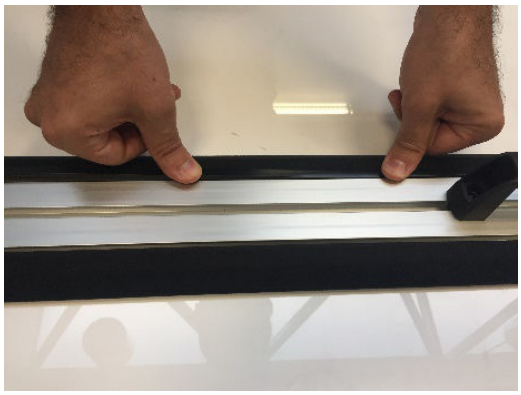
5. Remove both rods from the velvet.

6. Insert the rods into the new velvet.

7. Place the new velvet with the rods inside the beam slots.

8. Insert the black slot covers into the first slot.

9. Insert the black slot covers into the second slot, ensuring that the velvet remains flat under the beam.

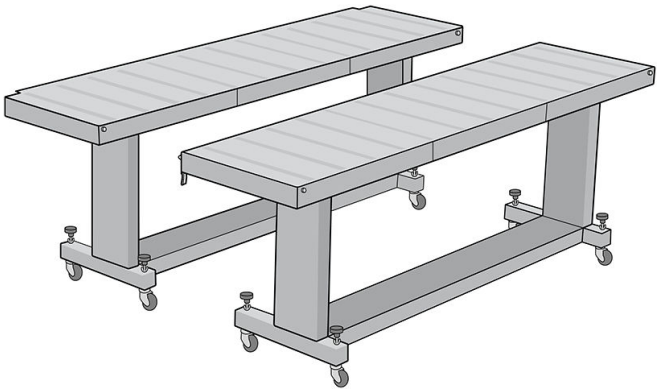


10. Reinstall the bracket that you removed earlier.

Lateral bracket replacement

The lateral brackets can become damaged during manipulation. In case of deformation of the bracket, it can be easily replaced by a new part using a T20 screwdriver.

Extension tables



A extra pair of input and output tables for rigid substrate handling can be purchased as an accessory. When properly assembled and attached to the ends of the standard tables provided with the printer, the extension tables enable safe and reliable handling of large substrate sheets.

⚠ CAUTION: The weight of the substrate should not exceed 60 kg (132 lb).

CAUTION: Do not use the tables as a place to store substrate.

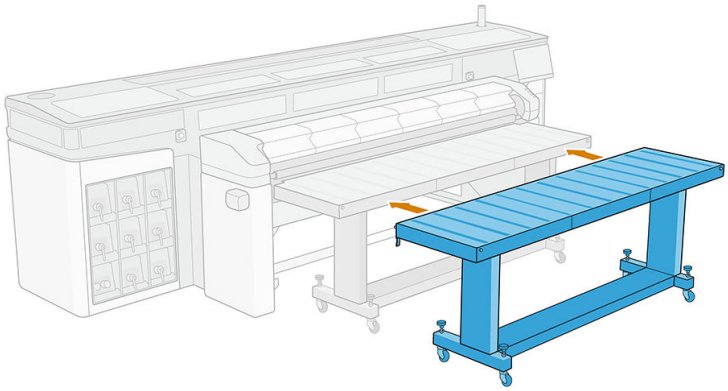
CAUTION: The standard and accessory extension tables are intended for use only when attached to the printer as described in these instructions. When not in use, the tables should be stored with the table tops folded in the storage position. Use caution when operating the table tops and moving the tables, to avoid personal injury or damage to property.

NOTE: If the accessory tables were properly leveled when they were installed, they should not need to be leveled again. If substrate feed problems occur, make sure the accessory tables are securely latched to the standard tables, and verify that the tables are level. Check first that the fixed support assembly is level, then check the folding support, and adjust the table wheels up or down as necessary.

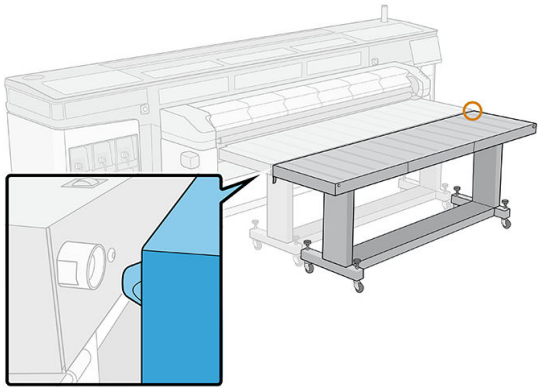
During use, the extension tables must be latched to the standard tables for safety and best print quality.

How to connect and level tables

1. To connect the extension tables to the standard tables, take an extension table and place it in front of the one already installed on the printer.

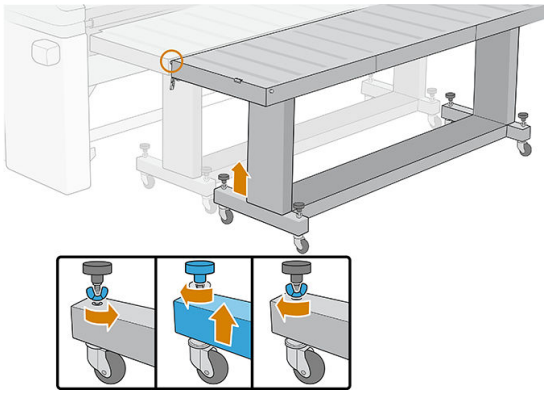


2. Locate the docking element at each end of the table.

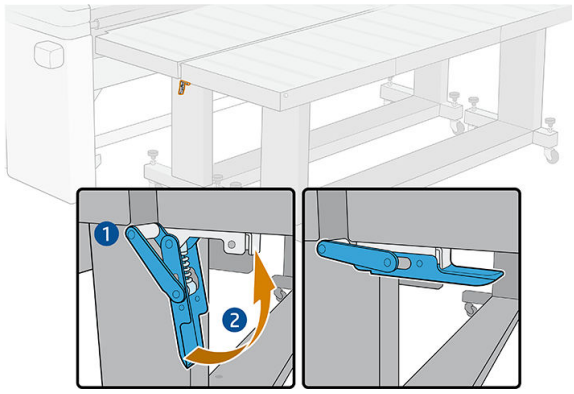


NOTE: You can use an extension table on either side of the printer, but always connected to a standard table, not connected directly to the printer.

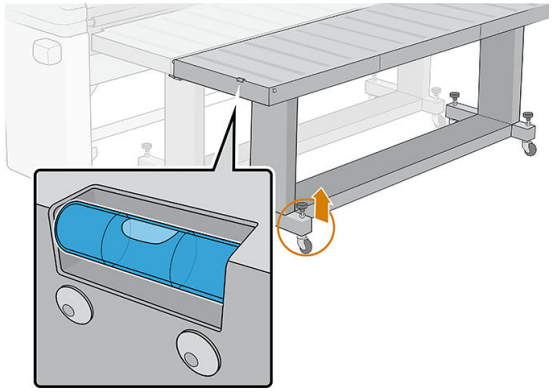
3. Turn the front-wheel knob until the docking elements align.



4. Once the connector is inserted, close the latch to fix it in place. Repeat the process at the other side of the table.

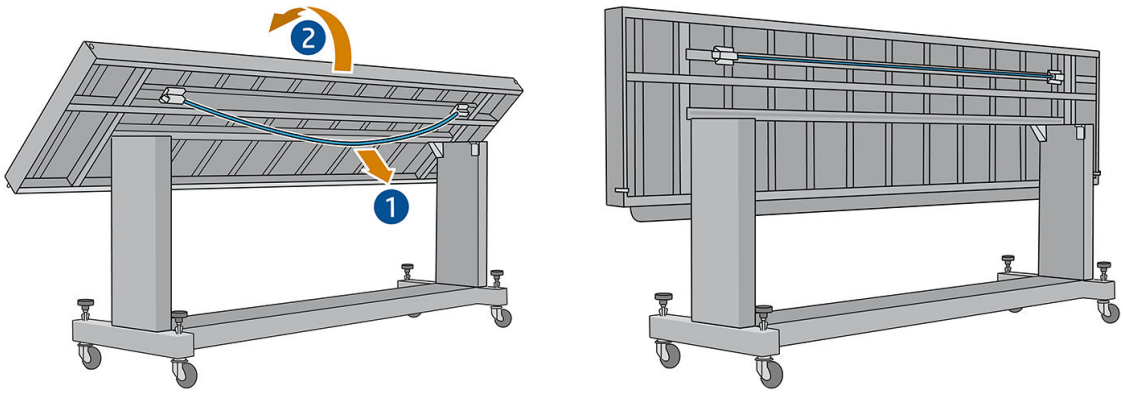


5. Once the front side of the table is fixed to the printer, use the rear-wheel knob to level the table. Use the bubble level installed at each end of the table as a reference.



TIP: If you need to access the input print zone, you can unlatch one side of the extension table and move this side away. Put back the table and latch to continue working as usual.

Extension tables must be stored folded when not in use. Pull the blue cord at the bottom to allow the table to move, and turn the table upright.



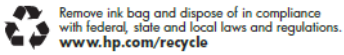
Disposal instructions

HP provides many free and convenient ways to recycle your used original HP ink supplies. Additionally, HP provides a free program for business customers to return signage printed using selected recyclable HP large-format substrates. For more information about these HP programs, see http://www.hp.com/recycle.

For your printer, the following items can be recycled by the HP supplies recycling program:

- HP 886 Latex Printheads
- HP recyclable large-format substrates

HP 3 and 5 liter Latex Ink Cartridges should be disposed of following the instructions on the cartridge packaging. The ink back should be removed and disposed of in compliance with federal, state, and local regulations. The other ink cartridge parts (plastic retainer and packaging box) can be recycled through commonly available recycling programs.



Dispose of other supplies and accessories in compliance with federal, state, and local regulations.

HP recommends that you wear gloves when handling ink-system components.

17 Order supplies and accessories

There are two alternative ways to order supplies or accessories:

- Visit http://www.hp.com/go/latexR1000/accessories or http://www.hp.com/go/latexR2000/accessories on the Web. There you will also see the latest list of supplies and accessories for your printer.
- Contact HP Support (see When you need help on page 271), and check that what you want is available in your area.

The rest of this chapter lists the available supplies and accessories, and their part numbers, at the time of writing.

Order ink supplies

You can order the following ink supplies for your printer.

Ink cartridges

Ink cartridge	Part number
HP 872 3L Cyan Latex Ink Crtg	G0Z01A
HP 872 3L Magenta Latex Ink Crtg	G0Z02A
HP 872 3L Yellow Latex Ink Crtg	G0Z03A
HP 872 3L Black Latex Ink Crtg	G0Z04A
HP 872 3L Lt Cyan Latex Ink Crtg	G0Z05A
HP 872 3L Lt Magenta Latex Ink Crtg	G0Z06A
HP 872 3L Optimizer Latex Ink Crtg	G0Z07A
HP 872 3L Overcoat Latex Ink Crtg	G0Z08A
HP 886 3L White Latex Ink Crtg	G0Z09A
HP 882 5L Cyan Latex Ink Crtg	G0Z10A
HP 882 5L Magenta Latex Ink Crtg	G0Z11A
HP 882 5L Yellow Latex Ink Crtg	G0Z12A
HP 882 5L Black Latex Ink Crtg	G0Z13A
HP 882 5L Lt Cyan Latex Ink Crtg	G0Z14A
HP 882 5L Lt Magenta Latex Ink Crtg	G0Z15A
HP 882 5L Optimizer Latex Ink Crtg	G0Z16A
HP 882 5L Overcoat Latex Ink Crtg	G0Z17A

Printheads

Printhead	Part number
HP 886 White Latex Printhead	G0Z21A
HP 886 Optimizer Latex Printhead	G0Z22A
HP 886 Latex Printhead	G0Z24A

Other supplies

Item	Part number
HP Latex Printhead Cleaning Kit	G0Z00A

Order accessories

The following accessories can be ordered for your printer, depending on which printer model you have: see Printer accessories and consumables on page 2.

Accessories

Name	Part number
HP Latex R Series White Upgrade Kit	T7V19A
HP Latex R1000 Roll Printing Kit	T7V20A
HP Latex R1000 Extension Tables	T7V21A
HP Latex R2000 Roll Printing Kit	T7V22A
HP Latex R2000 Extension Tables	T7V23A
HP Latex R Series Edge Holders Kit	Y6V16A

18 Printer specifications

- Functional specifications
- Physical specifications
- Memory specifications
- Power specifications
- Air supply requirements (pneumatic spindle)
- Ecological specifications
- Environmental specifications
- Ventilation
- Air conditioning
- Acoustic specifications

Functional specifications

Ink supplies

Printheads	Universal, optimizer, white
Ink cartridges	Cyan, magenta, yellow, black, light cyan, light magenta, optimizer, overcoat, white

Substrate sizes

	Minimum	Maximum (R1000)	Maximum (R2000)
Sheet size	297 × 420 mm (11.7 × 16.5 in)	1.63 m (64 in) wide	2.49 m (98 in) wide
Sheet weight		60 kg (132 lb)	60 kg (132 lb)
Flexible sheet thickness		0.5 mm (0.0197 in)	0.5 mm (0.0197 in)
Rigid sheet thickness		50 mm (1.97 in)	50 mm (1.97 in)
Roll width	635 mm (25 in)	1.63 m (64 in)	2.49 m (98 in)
Roll diameter	80 mm (3.15 in) (core diameter)	250 mm (9.8 in)	250 mm (9.8 in)
Roll weight		68 kg (150 lb)	100 kg (220 lb)
Roll weight with table-top roll holder		20 kg (44 lb)	20 kg (44 lb)

NOTE: Narrow substrates can be damaged during printing if they are very weak.

Physical specifications

Printer physical specifications

	HP Latex R1000	HP Latex R2000
Weight	1382 kg (3046.8 lb)	1587 kg (3498.7 lb)
Width	4.21 m (13 ft 9.75 in)	5.10 m (16 ft 8.79 in)
Depth	2.04 m (6 ft 8.31 in)	2.04 m (6 ft 8.31 in)
Height	1.747 m (5 ft 8.78 in)	1.747 m (5 ft 8.78 in)

Memory specifications

Memory specifications for the Internal Print Server computer

Memory (DRAM) supplied	8 GB
Hard disk	500 GB

Power specifications

The drying and curing components are powered with a three-phase line that requires a power distribution unit (PDU).

Power specifications for drying and curing components

Mains power, input rated current	
3-phase (line-to-line voltage)	200–240 V AC (±10%), 50/60 Hz, 56 A max
3-phase (line-to-line voltage)	380–415 V AC (±10%), 50/60Hz, 35 A max
PC power (optional) and white-ink low-power mode, input rated current	
1-phase	100–127 V AC (±10%), 50/60Hz, 10 max
1-phase	200–240 V AC (±10%), 50/60Hz, 10 max

Air supply requirements (pneumatic spindle)

Air pressure supply

The pneumatic spindle requires an air compressor or a pressurized air line, not supplied with the printer.

TIP: You are recommended to use a pressure gauge that indicates the pressure in bars.

Air supply specifications

Air pressure	6 bar (87 psi)
Minimum airflow	Recommendation: 30 l/min
Lubricator	Not recommended
Air filter (recommended)	Recommendation: 5 µm, auto-drain, 99.97% coalescing efficiency
Regulator (required)	Regulator with pressure gauge

Pneumatic connector

The printer comes with an air gun that you must attach to your air supply. In order to connect your air supply to the air gun, you must meet the following requirements:

- 9.84 mm (0.25 in) female connector, BSP or NPT thread
- Tape to secure the connection and prevent air leaks

Ecological specifications

For the up-to-date ecological specifications of your printer, go to http://www.hp.com/ and search for “ecological specifications”.

Environmental specifications

Printer environmental specifications

	Temperature range	Humidity range	Temperature gradient
Operating for optimal print quality	20 to 25°C (68 to 77°F)	30 to 60% relative humidity	10°C/h (18°F/h) or less
Operating for standard printing	15 to 30°C (59 to 86°F)	20 to 70% relative humidity	10°C/h (18°F/h) or less

Printer environmental specifications (continued)

	Temperature range	Humidity range	Temperature gradient
Not operating, in transport or storage, ink in tubes	5 to 55°C (41 to 131°F)	90% relative humidity at 55°C (131°F)	10°C/h (18°F/h) or less
Not operating, in transport or storage, no ink in tubes *	–25 to 55°C (–13 to 131°F)	90% relative humidity at 55°C (131°F)	10°C/h (18°F/h) or less

* If the printer is going to be kept at a temperature of less than 5°C, call your service representative to empty the ink from the tubes.

Maximum operating altitude: 3000 m (10000 ft)

The printer should not be exposed to direct sunlight or any other strong light source, and it should not be used in a dusty environment.

Ventilation

Ensure that the room in which the system is installed meets local environmental, health, and safety (EHS) guidelines and regulations.

Fresh air ventilation is needed to maintain comfort levels. For a more prescriptive approach to adequate ventilation, you could refer as guidance to the latest edition of the ANSI/ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) document 62.1: *Ventilation for Acceptable Indoor Air Quality*.

Adequate ventilation needs to be provided to ensure that potential airborne exposure is adequately controlled according to Safety Data Sheets. Consult the Safety Data Sheets available at http://www.hp.com/go/msds to identify chemical ingredients of your ink consumables.

Airborne materials can be readily identified and quantified by using established indoor air quality testing protocols. HP performs these assessments during the development phase for all products.

HP testing shows that during printer operation, the concentrations of airborne contaminants measured in the workspace are consistently well below key occupational exposure limits. This observation is based on exposure assessments that model very active productivity at customer facilities. Customers should recognize that actual levels in their facilities are dependent on workspace variables they control such as room size, ventilation performance and duration of equipment use.

HP's assessment concluded, based on the available scientific information, that airborne materials are not expected to present a health hazard by providing a minimum of 10 ACH (air changes per hour) of fresh air ventilation and a minimum room volume of:

- 120 m^3 (4238 ft^3) HP Latex R1000 Printer
- 185 m^3 (6533 ft^3) HP Latex R2000 Printer

These specifications are valid for the following conditions: one HP printer using a black area fill plot at 100 m^2/h (1076 ft^2/h), 3 passes, 80% of ink, assuming 8 hours of printing exposure time a day. If there is more equipment in the room, or different conditions the ventilation rate should be recalculated accordingly.

In addition to the workspace benefit provided by general room ventilation, intense use of this printer system in some customers' facilities may require the use of localized ventilation in order to provide a readily acceptable working environment. This installation of localized exhaust for a printer frequently enables the capture of airborne contaminants near their source of generation, and subsequent allows their efficient removal from the building through contained, and relatively low volume air flow. A workspace health and safety professional can provide guidance on the design and use of this auxiliary ventilation equipment.

Air conditioning

In addition to fresh air ventilation to avoid health hazards, consider also maintaining workplace ambient levels by ensuring the climatic operating conditions specified in this guide (see Environmental specifications on page 295) to avoid operator discomfort and equipment malfunction. Air conditioning in the work area should take into account that the printer produces heat. Typically, the printer's power dissipation is:

- 9 kW (30.7 kBTU/h) for the HP Latex R1000
- 11 kW (37.5 kBTU/h) for the HP Latex R2000

Air conditioning should meet local environmental, health, and safety (EHS) guidelines and regulations.

NOTE: The air conditioning units should not blow air directly onto the equipment.

Acoustic specifications

Printer acoustic specifications

	HP Latex R1000	HP Latex R2000
Idle sound pressure at bystander position according to ISO 11202	58 dB (A)	58 dB (A)
Operating sound pressure at bystander position according to ISO 11202	69 dB (A)	71 dB (A)

A Rigid substrate recommendations

The rigid substrate types described in this appendix are compatible with your printer.

- Recommended print modes (introduction)
- Use Sensitive Mode with heat-sensitive substrates
- Predefined substrate settings
- Acrylic sheet (PMMA)
- Aluminum composite panel (ACP)
- Compressed cardboard or cardstock
- Corrugated cardboard
- Corrugated plastic
- Foam board
- Foam PVC
- Glass and ceramics
- Wood
- Polycarbonate sheet
- Polystyrene sheet
- Polypropylene sheet
- PVC rigid sheet (U-PVC)
- PET (A-PET, PET-G) rigid sheet
- PE (LDPE, HDPE) rigid sheet
- Honeycomb panels
- Metal panels

Recommended print modes (introduction)

The recommended print modes in this chapter include the print modes that are standard and recommended by HP for a substrate family. This recommendation is based on HP's internal testing and, in most cases, provides a good starting point for printing on substrates within a specific substrate family.

Although HP tests are performed on an extensive set of substrates, there is no guarantee that these settings are suitable for every substrate. Additional, optimized print modes for specific substrates can be created by cloning and modifying an existing one. See Add a substrate preset on page 75 for more information.

Use Sensitive Mode with heat-sensitive substrates

To print in Sensitive Mode, enable the curing lever. When you have finished printing in Sensitive Mode, disable the curing lever.

Some substrates, due to their chemical composition or thickness, can be especially sensitive to the heat produced by the curing module. Examples include PVC foams, and solid plastics thinner than 3 mm.

After such a substrate has been loaded into the printer, the Internal Print Server notifies you, within the substrate widget, that the substrate is potentially sensitive, and that you should set curing to work in Sensitive Mode. Not all print modes can be used in this mode; check that the print mode for the job is supported in Sensitive Mode before printing.

When you tap **Print**, if necessary the printer will give you a final reminder to set Sensitive Mode and choose an appropriate print mode; but you can choose to ignore the reminder.

Predefined substrate settings

Substrate type	Feed method	Weight	Detectable by printer	Use rollers	Conductive	Vacuum fan level	Examples
Aluminum composite	Sheet	Light	No	Yes	Yes	Medium	Alumacore, Alumalite, Dibond, Graphic-AL, Omega-Bond
Clear sheet	Sheet	Light	No	Yes	No	Medium	Acrylic, Plexiglas, Glass, Polycarbonate
Compressed cardboard or cardstock	Sheet	Light	Yes	Yes	No	High	Tag board, Poster board
Corrugated cardboard	Sheet	Light	Yes	Yes	No	High	Cardboard, Corrugated fiberboard
Corrugated plastic	Sheet	Light	Yes	Yes	No	Medium	Coroplast, Correx, Corflute, Polypropylene
Foam board	Sheet	Light	Yes	Yes	No	High	Fome Core, Mighty Core
Foam PVC	Sheet	Light	Yes	Yes	No	Medium	Sintra, Komatex, Celtec, Forex
Magnetic	Sheet	Light	Yes	Yes	Yes	Medium	Promag
Plywood	Sheet	Heavy	Yes	Yes	No	Off	MDO, MDF
Polystyrene	Sheet	Light	Yes	Yes	No	Medium	Styrene
Polystyrene foam board	Sheet	Light	Yes	Yes	No	Medium	Gatorplast, Ultraboard

Acrylic sheet (PMMA)

Brand name examples: Plexiglas, Acrylite, Optix, Crylon, Crylux, Perspex, Lucite, Marcryl, Altuglas

Preparation

- Ensure that the sheet is flat. Sheets that are deformed along either axis (left to right, or front to back) can cause the printhead to strike the substrate.
- Peel the protective film off one side, leaving the other side protected until finishing or installation of the finished graphic.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Use clean cotton gloves to avoid fingerprints.
- Handle samples with care. Scratches on the substrate before printing will be visible after printing.
- Cast acrylic substrates may require extra care when printing, because of the way they are made. When loading a sheet, pay attention to thickness differences within the same sheet, which may be up to ±10%. HP recommends measuring the thickness at different points and manually entering the highest measured thickness value.

Printing

- These materials are heavy in large sizes. Do not exceed 60 kg (132 lb) sheets.
- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use an available generic preset. For frontlit applications, load the substrate as **Generic Solid Plastic**. For backlit applications, load the substrate as **Generic Backlit Solid Plastic**.
- Both frontlit and backlit acrylics have generic underflood, overflood, and spot print modes available for white printing.

Recommended print modes

IMPORTANT: HP recommends using Sensitive Mode when the substrate is less than 3 mm (0.1 in) thick. See Use Sensitive Mode with heat-sensitive substrates on page 299.

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Indoor signage** print mode for applications that will be viewed from short distances. For increased saturation, use **High quality**.

	Color-only print modes (no white)				
Generic presets	Fast	Outdoor signage	Indoor signage	High quality	Heat-sensitive
Generic Solid Plastic	N/A	N/A	6p-100%	12p-120%	12p-110%
Generic Backlit Solid Plastic	N/A	N/A	N/A	14p-200%	18p-180%

- To print images that require white ink, the following print modes are available:

- **Overflood:** Use this white mode in applications that are printed on the second surface and are viewed through the substrate. In this mode a color layer is printed first and, afterwards, a white ink layer is printed on top. This mode is generally used on clear substrates and requires flipping the image in the RIP or image-editing software.
- **Underflood:** Use this white mode in applications that use colored substrates and require realistic colors. In this mode, a white ink layer is printed first and then a color layer is put on top of it.
- **Spot:** This mode is normally used on both transparent and colored substrates when white ink is not mixed with other colors in the same area.
- **Sandwich:** A white layer is embedded between two different images, allowing a different image to be seen on each side of the shape.

All the generic white print modes use the same amount of colored ink. The white print modes **W100**, **W160**, and **W260** differ only in the amount of white ink used.

Select **White OF W100** when white opacity requirements are normal. For increased white opacity, select **White OF W160**. For maximum white opacity, select **White OF W260**.

	Color + white print modes									
	Underflood white modes			Overflood white modes				Spot white modes		
Generic presets	White UF W100	White UF W160	White UF W260	White OF W100	White OF W100 heat-sensitive	White OF W160	White OF W260	White SP W100	White SP W160	White SP W260
Generic Solid Plastic	N/A	N/A	33p-120 %	16p-120 %	24p-110 %	24p-120 %	N/A	N/A	11p-110 %	18p-120 %
Generic Backlit Solid Plastic	N/A	N/A	N/A	26p-200 %	N/A	N/A	N/A	N/A	N/A	N/A

Output handling

- Use caution when loading or lifting sheets off the table, as the substrate and ink can be easily scratched.
- When stacking samples, HP recommends placing some material between the acrylic sheets to protect them against scratching.
- Use clean cotton gloves to avoid fingerprints.
- HP particularly recommends using gloves when handling freshly-printed sheets, as they will be hot (though not hot enough to burn your hands).

Known incompatibility

- Extruded acrylic sheets that are thin and wide have a tendency to deform, and have a high risk of causing printhead crashes. Use sheets with a maximum width of 1.5 m (59 in) when printing on extruded acrylic substrates up to 3 mm (0.12 in) in thickness.

  Possible solutions: Pre-cut samples at 1.5 m (59 in), use cast acrylic or polycarbonate sheets instead of extruded ones when printing on thin sheets, or use thicker sheets: 5 mm (0.20 in).

Aluminum composite panel (ACP)

Brand name examples: Alumacore, Alumalite, Dibond, Graphic-AL, Omega-Bond

Preparation

- Peel the protective film off one side, leaving the other side protected until finishing or installation of the finished graphic.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Ensure that the substrate is flat and there are no damaged corners, edges, or ends. If the edges are bent, they should be flattened before printing. A head height greater than the standard 1.8 mm (0.07 in) may be necessary to avoid damaged or bowed edges that will interfere with the path of the carriage.
- Use clean cotton gloves to avoid fingerprints and avoid the risk of cutting yourself with the edges of the sheet.
- Handle samples with care. Scratches on the substrate before printing will be visible after printing.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic Aluminium Composite Panel** preset.
- Aluminium composite panels have generic underflood and spot print modes available for white printing.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Indoor signage** print mode for applications that will be viewed from short distances. For increased saturation, use **High quality**.

	Color-only print modes (no white)			
Generic presets	Fast	Outdoor signage	Indoor signage	High quality
Generic Aluminium Composite Panel	N/A	N/A	6p-100%	12p-120%

- To print images that require white ink, the following print modes are available:
  - **Underflood:** Use this white mode on substrates such as brushed or colored aluminium when you need realistic colors. In this mode, a white ink layer is printed first and then a color layer is put on top of it.
  - **Spot:** This mode is normally used on substrates such as brushed or colored aluminium when white ink is not mixed with other colors in the same area.

Generic presets	Color + white print modes								
	Underflood white modes			Overflood white modes			Spot white modes		
	White UF W100	White UF W160	White UF W260	White OF W100	White OF W160	White OF W260	White SP W100	White SP W160	White SP W260
Generic Aluminium Composite Panel	N/A	N/A	33p-120 %	N/A	N/A	N/A	N/A	N/A	18p-120 %

Output handling

- Use caution when loading or lifting sheets off the table, as the substrate and ink can be easily scratched.
- HP recommends using gloves when handling freshly-printed sheets, as they will be hot (though not hot enough to burn your hands).

Compressed cardboard or cardstock

Also known as cover stock, paperboard, pasteboard, and tag board

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Changes in temperature or humidity will cause the material to warp and may cause printhead crashes.
- Some coated sheets may interact with the ink, yielding poor print quality. Test coated materials for compatibility before purchasing significant quantities.
- Clean with a lint-free cloth to remove any dust and debris.
- Use gloves when handling the substrate to avoid transferring fingerprints and oils to the print surface.
- The substrate can bend and crease easily. Watch for edges that may strike the carriage.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic Compressed Cardboard** preset.
- Some cardboard substrates, especially uncoated ones, are porous and may absorb the ink, giving a washed-out appearance. Use the Add a substrate preset on page 75 process to increase the amount of ink or to create an underflood white printmode to boost colour saturation.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Outdoor signage** print mode for applications that will be viewed from medium to long distances. For increased saturation, use **Indoor signage** or **High quality**.

	Color-only print modes (no white)			
Generic presets	**Fast**	**Outdoor signage**	**Indoor signage**	**High quality**
Generic Compressed Cardboard	N/A	4p-80%	6p-100%	8p-110%

- There are no white generic presets for compressed cardboards. If white ink is needed (for colored or uncoated cardboards), see Add a substrate preset on page 75.

Output handling

- Use gloves to avoid transferring fingerprints and oils to the print surface.
- In some cases, particularly thin samples—thinner than 1.5 mm (0.06 in)—may warp during the printing process. Allow samples to rest for 10–15 min after printing to recover their initial shape.

Corrugated cardboard

Also known as corrugated fiberboard and box board

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Recommended storage conditions: 19–23°C (66–73°F), 55–65% RH. Changes in temperature or humidity will cause the material to warp.
- After taking boards from the pallet, cover the pallet with its original packaging and, if possible, strap it again.
- The substrate can bend and crease easily. Watch for edges that may strike the carriage.
- Concave bent boards are much preferable to convex ones. Ordering boards with the same liner on both sides allows you to choose the side that is more suitable for holding.
- For some very bent samples, tape and edge holders may be needed.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic Corrugated Cardboard** preset.
- Cardboard substrates, especially uncoated ones, are porous and may absorb the ink, giving a washed-out appearance. Use the Add a substrate preset on page 75 process to increase the amount of ink or to create an underflood white printmode to boost colour saturation.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Outdoor signage** print mode for applications that will be viewed from a distance of at least 3 m (10 ft). For increased saturation, use **Indoor signage** or **High quality**.

	Color-only print modes (no white)			
Generic presets	Fast	Outdoor signage	Indoor signage	High quality
Generic Corrugated Cardboard	N/A	4p-80%	6p-100%	8p-110%

- There are no white generic presets for corrugated cardboards. If white ink is needed (for colored or uncoated cardboards), see Add a substrate preset on page 75.

Output handling

- In some cases, samples may warp during the printing process. Allow samples to rest for 10–15 min after printing to recover their initial shape.

Known incompatibility

- Very bent samples may not be printable.

Corrugated plastic

Also known as corrugated or fluted polypropylene

Brand name examples: Corflute, Coroplast, Correx, Akyplac, Akylite, Cor-X

Preparation

- The quality of corrugated polypropylene can vary greatly. A corona treatment is generally applied when manufactured to increase the surface tension for better ink adhesion. This corona treatment will diminish over time. Substrate that has been shipped long distances or stored for an extended period of time will have more problems with ink adhesion.
- This substrate tends to hold static charge. Avoid sliding it from the stack or carrying it across carpeted surfaces.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Substrates are often supplied in non-rectangular form, so trimming them to rectangular may be necessary for some applications, such as edge-to-edge printing. Make sure all edges are cut clean and are free from burrs and/or excess substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic Plastic Corrugated** preset.
- Faster print speeds can be obtained without noticeable banding by feeding the substrate with the flutes parallel to the printhead carriage motion.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Fast** print mode for applications that will be viewed from a distance of at least 3 m (10 ft) and do not need saturated colors. For increased color saturation, use **Outdoor signage** or **Indoor signage**.

	Color-only print modes (no white)			
Generic presets	Fast	Outdoor signage	Indoor signage	High quality
Generic Plastic Corrugated	3p-70%	4p-90%	6p-110%	N/A

- There are no white generic presets for corrugated plastics. If white ink is needed, see Add a substrate preset on page 75.

Output handling

- Although ink adhesion may improve over 24 hours, latex inks create a thin and flexible layer that do not allow ink to self-delaminate from the surface over time.
- In some cases, samples may warp during the printing process. Allow samples to rest for 10–15 min after printing to recover their initial shape. If the original shape cannot be recovered, decreasing curing temperature may help.

Foam board

Brand name examples: Fome-Cor, Kapa, Gator, MightyCore, Airplac, Gatorplast, Kapa plast, Ultraboard, Infinity

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Changes in temperature or humidity will cause the substrate to warp.
- Foam boards with plastic liners tend to hold static charge. Avoid sliding the substrate from the stack or carrying it across carpeted surfaces. Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- For plastic liner foam boards, if an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- The substrate is susceptible to dents and damage. Watch for corners and edges that may strike the carriage.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic Paper Foamboard** preset for substrates with a cellulosic liner, or the **Generic Plastic Foamboard** preset for substrates with a plastic liner.
- These substrates are heat-sensitive, and HP does not recommend exceeding a 70°C (158°F) curing temperature to avoid deformations, liner delamination, and substrate thickness increase.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Outdoor signage** print mode for applications that will be viewed from a distance of at least 3 m (10 ft) and do not need saturated colors. For increased color saturation, use **Indoor signage** or **High quality**.

	Color-only print modes (no white)			
Generic presets	Fast	Outdoor signage	Indoor signage	High quality
Generic Foam Board	N/A	4p-80%	6p-100%	8p-110%

- There are no white generic presets for foam boards. If white ink is needed (for colored boards), see Add a substrate preset on page 75.

Output handling

- You can usually recover from heat warp by laying the substrate flat and allowing it to cool.
- Always use a very sharp blade when trimming.
- The substrate is susceptible to dents, and it damages more easily than most other substrate types. Handle samples with care.
- Substrates with paper liner have a delicate surface that may show gloss changes if they are slid from the stack. Handle paper-liner substrates with special care.

Foam PVC

Also known as closed-cell PVC foamboard

Brand name examples: Celtec, Forex, Komatex, Sintra, Palight, Trovicel

Preparation

- If the substrate has a protective film attached, peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Some foams may have a smooth and soft surface that can be easily scratched or damaged. Handle substrates with care.

Printing

- Check at https://www.printos.com/ml/#/homeMediaLocator whether the substrate preset for your specific substrate is available. If it is, download and install it in your printer and RIP.
- If there is no specific substrate preset for your substrate, use the **Generic PVC Foam** preset.

Recommended print modes

NOTE: Not all print modes may be available at the printer's introduction date.

- To print color images that do not require white ink, select the **Fast** print mode for applications that will be viewed from a distance of at least 3 m (10 ft). For increased color saturation, use **Outdoor signage** or **Indoor signage**.

Generic presets	Color-only print modes (no white)			
	Fast	Outdoor signage	Indoor signage	High quality
Generic PVC Foam	3p-70%	4p-90%	6p-110%	N/A

- To print images that require white ink, the following print modes are available:
  - **Underflood:** Use this white mode on colored foam when you need realistic colors. In this mode, a white ink layer is printed first and then a color layer is put on top of it.
  - **Spot:** This mode is used on colored foam substrates when white ink is not mixed with other colors in the same area.

Generic presets	Color + white print modes								
	Underflood white modes			Overflood white modes			Spot white modes		
	White UF W100	White UF W160	White UF W260	White OF W100	White OF W160	White OF W260	White SP W100	White SP W160	White SP W260
Generic PVC Foam	N/A	N/A	33p-120 %	N/A	N/A	N/A	N/A	N/A	18p-120 %

Substrates thinner than 2.5 mm may show a higher tendency to deform than thicker substrates. For thin substrates, HP recommends using the available heat-sensitive print modes. Heat-sensitive print modes provide a smoother temperature ramp that improves sheet flatness.

	Color + white heat-sensitive print modes		
Generic presets	Fast heat-sensitive	Heat-sensitive	Heat-sensitive with white
Generic PVC Foam	8p-80%	12p-110%	

Output handling

- No special handling required.
- If ink adhesion is inadequate, wait 24 hours before finishing.
- Always use a sharp blade when cutting.

Glass and ceramics

Considerations

- The smooth, non-porous surface of glass does not provide a good interface for ink to adhere, making it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.
- Adhesion can be improved with the use of a pre-treatment or primer.

Preparation

- Use a lint-free cloth with a glass cleaner to remove dust or debris. Do not use a detergent.
- Use clean cotton gloves to avoid fingerprints.
- If a pre-treatment primer is used, apply it according to the instructions and allow it to dry before printing.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.
- For applications that require fine detail, use the **Fine text** option and/or lower the printhead height from its nominal 2.2 mm (0.085 in) setting.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can easily be scratched.
- Use protective gloves to avoid the risk of burning your hands.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

Wood

Examples: Raw, primed or painted wood, MDO, MDF

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Changes in temperature or humidity will cause the substrate to warp.
- Substrates are often supplied non-rectangular, so trimming them to rectangular may be necessary for some applications, such as edge-to-edge printing. Make sure all edges are cut clean and are free from burrs and/or excess substrate.
- Use compressed air to blow dust and debris from the printing surface.

Recommended print modes

- Depending on application, ink coverage, image content, and wood surface, all print modes may print acceptably.

Printing

- Select **Wood** when configuring and loading these substrates.
- Some surfaces are more porous and absorb the ink, giving a washed-out appearance. Use the RIP software's **Saturated rendering intent** option to increase saturation.
- Non-white substrates may not be detected by the onboard camera. If so, create a copy of the **Wood** substrate using the Substrate Wizard, and change the **Detectable by printer** option to **No**.
- Due to the strength and shape memory of wood products, the printer may not be able to feed some warped sheets.
- A head height greater than the normal 2.2 mm (0.085 in) setting may be necessary to avoid the carriage scraping on non-flat materials.
- Use a Wood substrate preset from the RIP software.

Output handling

- These substrates are heavy in large sizes. Do not exceed 68 kg (150 lb).

Polycarbonate sheet

Brand name examples: Lexan, Makrolon, Tuffak

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

Polystyrene sheet

Examples: High-impact polystyrene sheet, HIPS

Preparation

- This substrate tends to hold static charge. Avoid sliding it from the stack or carrying it across carpeted surfaces.
- Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.

Printing

- Select **Polystyrene** when configuring and loading these substrates.
- These substrates are heat-sensitive, specifically thinner sheets: less than 0.4 mm (0.015 in). They may require a higher vacuum setting, faster print modes, greater than standard head height, and printing delays in some combination to achieve best output.
- Use a Polystyrene substrate preset from the RIP software.

Output handling

- If ink adhesion is inadequate, print in a higher-quality mode and/or wait 24 hours before finishing.
- Always use a sharp blade when cutting.

Polypropylene sheet

Brand name examples: Akyplen, Polygraph.ics.P

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

PVC rigid sheet (U-PVC)

Brand name examples: Akyplen, Polygraph.ics.P

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

PET (A-PET, PET-G) rigid sheet

Brand name examples: Lumex, Vivak

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

PE (LDPE, HDPE) rigid sheet

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

Honeycomb panels

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

Metal panels

Considerations

- In general, ink adhesion is better on polycarbonate then on acrylic or glass.
- However, the smooth, non-porous surface makes it susceptible to scratches and scraping. Special precautions are necessary in the handling and display of the printed piece to protect it from abrasion.

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- This material tends to hold static charge. Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Depending on the end-use application, ink adhesion may be an issue. Use of a polycarbonate primer can improve ink adhesion.

Printing

- Select **Clear Sheet** when configuring and loading these substrates.
- Substrate placement detection is disabled when using these substrates. When loading, it is necessary to enter the location of the left (user side) and right (service side) edges of the substrate according to the **Substrate measurement option**.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Use clean cotton gloves to avoid fingerprints.
- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Depending on the end use application, some treatment after printing may be necessary to minimize the risk of surface damage.

B Flexible substrate recommendations

The flexible substrate types described in this appendix are compatible with your printer, if the roll-to-roll upgrade kit has been installed and enabled.

NOTE: HP recommends the use of the hold-down plate for better control of the substrate during printing. See Hold-down plate on page 282.

- Predefined substrate settings
- Self-adhesive vinyls
- PVC banners
- Papers
- Textiles
- Flexible films

Predefined substrate settings

Substrate type	Feed method	Weight	Detectable by printer	Use rollers	Conductive	Vacuum fan level	Examples
Backlit banner	Roll	–	No	Yes	No	Medium	Translucent backlit film, Backlit banner
Frontlit banner	Roll	–	Yes	Yes	No	Medium	Scrim banner vinyl, PVC flex film
Canvas	Roll	–	Yes	Yes	No	Medium	HP Satin Canvas
Clear film	Roll	–	No	Yes	No	Medium	Polyester film, Cling vinyl
Photobase	Roll	–	Yes	Yes	No	Medium	HP UV Premium Photobase Paper
Self-adhesive vinyl (SAV)	Roll	–	Yes	Yes	No	Medium	Calendered vinyl, Cast vinyl
Textile	Roll	–	Yes	Yes	No	Medium	HP Heavy Textile Banner

NOTE: To print in Sensitive Mode, enable the curing lever. When you have finished printing in Sensitive Mode, disable the curing lever.

Self-adhesive vinyls

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Use clean cotton gloves to avoid fingerprints.

Printing

- These substrates are heavy in large sizes. Do not exceed 68 kg (150 lb).
- Depending on the end-use application, ink adhesion may be an issue. In addition, white ink overflood applications may develop small localized losses of adhesion. Use of an acrylic primer can improve overall ink adhesion.
- Select **Solid Plastic** when configuring and loading these substrates.
- Use a Clear Sheet substrate preset from the RIP software.

Output handling

- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Use clean cotton gloves to avoid fingerprints.
- Use protective gloves to avoid the risk of burning your hands.

PVC banners

Preparation

- Peel off the protective film from one side, leaving the other side protected until finishing or installation of the finished graphic.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.
- Ensure that the substrate is flat and that there are no damaged corners, edges, or ends.

Output handling

- Take care when loading or lifting sheets off the table, as substrate and ink can be easily scratched.
- Use protective gloves to avoid the risk of burning your hands.

Known incompatibility

- Avoid using aluminum composite materials, such as Alucobond, that have a polyvinylidene fluoride (PVDF) surface coating. PVDF coated materials have reduced ink adhesion and may not work for some applications.

Papers

Also known as: cover stock, paperboard, pasteboard, tag board

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Changes in temperature or humidity will cause the material to warp.
- Some coated sheets may interact with the ink, yielding poor print quality. Test coated materials for compatibility before purchasing significant quantities.
- Clean with a lint-free cloth to remove any dust and debris.
- Use gloves when handling the substrate to avoid transferring fingerprints and oils to the print surface.
- The substrate can bend and crease easily. Watch for edges that may strike the carriage.

Printing

- Select **Card Stock** when configuring and loading these substrates.
- Use a Card Stock substrate preset from the RIP software.
- Some materials are more porous and absorb the ink, giving a washed-out appearance. Use the RIP software's **Saturated rendering intent** option to increase saturation.

Output handling

- Use gloves to avoid transferring fingerprints and oils to the print surface.
- Use caution when lifting it off the table to avoid creases.

Textiles

Also known as: corrugated fiberboard, box board

Preparation

- Store substrates flat, in a clean environment with the same or similar temperature and humidity as in the printer room. Changes in temperature or humidity will cause the material to warp.
- Clean with a lint-free cloth to remove any dust and debris.
- The substrate can bend and crease easily. Watch for edges that may strike the carriage.

Recommended print modes

- Depending on application, ink coverage, and image content, all print modes may print acceptably. Faster print modes are less susceptible to bowing of the substrate due to heat.

Printing

- Select **Corrugated Cardboard** when configuring and loading these substrates.
- Some colored substrates may not be detectable by the onboard camera. In this case, create a copy of the Card Stock substrate using the Substrate Wizard and change the **Detectable by printer** option to **No**.
- Use the **Warped media** option when loading non-flat substrates. Using this option reduces the available print area.
- Use the lowest possible UV lamp power setting to cure the ink.
- Use a Corrugated Cardboard substrate preset from the RIP software.
- Some materials are more porous and absorb the ink, giving a washed-out appearance. Use the RIP software's **Saturated rendering intent** option to increase saturation.

Output handling

- Use caution when lifting it off the table to avoid creases.

Flexible films

Also known as: corrugated or fluted polypropylene

Preparation

- The quality of corrugated polypropylene can vary greatly. A corona treatment is generally applied when manufactured to increase the surface tension for better ink adhesion. This corona treatment will diminish over time. Substrate that has been shipped long distances or stored for an extended period of time will have more problems with ink adhesion.
- This substrate tends to hold static charge. Avoid sliding it from the stack or carrying it across carpeted surfaces.
- Follow the advice in Static electricity on page 42.
- Ensure that substrate tables are attached and secured to the printer to provide a grounding path for static-loaded substrate.
- Substrates are often supplied in non-rectangular form, so trimming them to rectangular may be necessary for some applications, such as edge-to-edge printing. Make sure all edges are cut clean and are free from burrs and/or excess substrate.
- Wipe the printing surface with an anti-static tack cloth to remove static charge and any dust or debris.
- If an anti-static tack cloth is not available, a general-purpose industrial cleaner (such as Simple Green) on a lint-free cloth can be used to remove dust or debris. Allow the sheet to sit out on the input table for about 5 minutes to allow the cleaner to evaporate and the static to dissipate.

Recommended print modes

- Depending on application, ink coverage, and image content, all print modes may print acceptably.
- Faster print speeds can be obtained without noticeable banding by feeding the substrate with the flutes parallel to the printhead carriage motion.

Printing

- Select **Corrugated Plastic** when configuring and loading these substrates.
- Non-white substrates may not be detectable by the onboard camera. In this case, create a copy of the Corrrugated Plastic substrate using the Substrate Wizard and change the **Detectable by printer** option to **No**.
- These substrates are heat-sensitive. They may require a higher vacuum setting, faster print modes, greater than standard head height, and printing delays in some combination to achieve best output.
- Use a Corrugated Plastic substrate preset from the RIP software.

Output handling

- Ink adhesion improves over 24 hours. Sometimes it is beneficial to wait 24 hours before cutting full-bleed prints.

C Supported HP flexible substrates

The flexible substrate types described in this appendix are compatible with your printer, if the roll-to-roll upgrade kit has been installed and enabled.

Category	Substrate	Automatic printhead alignment	Color calib.	Applications
HP Banners	HP Everyday Matte Polypropylene, 3-in Core 203 microns (8 mil) • 120 g/m² • 61 m (200 ft)	YES	YES	Trade show and event displays, POP and retail displays, Posters and photo enlargements, Banners
HP Self-adhesive Materials	HP Air Release Adhesive Gloss Cast Vinyl Without liner: 50 microns (2 mil) • 100 g/m² • 45,7 m (150 ft) With liner: 241 microns (9.5 mil) • 260 g/m² • 45,7 m (150 ft)	YES	YES	Trade show and event displays, Fleet graphics and vehicle wraps, Signage
	HP One-view Perforated Adhesive Window Vinyl Without liner: 165 microns (6.5 mil) • 155 g/m² • 50 m (164 ft) With liner: 406 microns (16 mil) • 288 g/m² • 50 m (164 ft)	NO	NO	Fleet graphics and vehicle wraps, Window graphics, POP and retail displays
	HP Permanent Gloss Adhesive Vinyl REACH Without liner: 121 microns (4.8 mil) •150 g/m² • 100 g/m² • 45,7 m (150 f • 91,4 m (300 ft) With liner: 266 microns (10.5 mil) • 280 g/m² • 45,7 m (150 ft • 91,4 m (300 ft)	YES	YES	Trade show and event displays, Signage, POP and retail displays
	HP Permanent Matte Adhesive Vinyl REACH Without liner: 121 microns (4.8 mil) •150 g/m² • 45,7 m (150 f • 91,4 m (300 ft) With liner: 266 microns (10.5 mil) • 280 g/m² • 45,7 m (150 ft • 91,4 m (300 ft)	YES	YES	
	HP Premium Removable Gloss Adhesive Vinyl REACH Without liner: 96 microns (3.8 mil) • 136 g/m² • 45,7 m (150 f) With liner: 284 microns (11.2 mil) • 298 g/m² • 45,7 m (150 ft)	YES	YES	
	HP Everyday Adhesive Matte Polypropylene, 3-in Core Without liner: 180 microns (7.1 mil) • 120 g/m² • 30,5 m (100 ft) With liner: 215 microns (8.5 mil) • 168 g/m2 ² • 30,5 m (100 ft)	YES	YES	Trade show and event displays, Signage, POP and retail displays, Banners

Category	Substrate	Automatic printhead alignment	Color calib.	Applications
HP Films	HP Backlit Polyester Film 220 microns (8.7 mil) • 285 g/m² • 30,5 m (100 ft)	NO	NO	Trade show and event displays, Backlit displays, POP and retail displays, Posters and photo enlargements
HP Fabrics	HP Light Fabric 381 microns (15 mil) • 218 g/m2 (6.2 oz) • 45,7 m (150 ft)	NO	NO	Trade show and event displays, POP and retail displays, Textiles (fabric printing), Banners, Interior decorations
HP Papers/ Photographic Papers	HP PVC-Free Wall Paper 177 microns (7 mil) • 175 g/m² • 30,5 m (100 ft) • 91,4 m (300 ft)	YES	YES	Trade show and event displays, Posters and photo enlargements, Interior decorations
	HP PVC-free Durable Smooth Wall Paper 431 microns (17 mil) • 290 g/m2 • 30,5 m (100 ft)	YES	YES	
	HP White Satin Poster Paper 165 microns (6.5 mil) • 136 g/m² • 61 m (200 ft)	YES	YES	Trade show and event displays, Backlit displays, POP and retail displays, Posters and photo enlargements, Billboards
	HP Photo-realistic Poster Paper 205 microns (8.1 mil) • 205 g/m² • 61 m (200 ft)	YES	YES	Trade show and event displays, POP and retail displays, Posters and photo enlargements
	HP Premium Poster Paper 228 microns (9 mil) • 200 g/m2 • 61 m (200 ft)	YES	YES	
	HP Blue Back Billboard Paper 165 microns (6.5 mil) • 123 g/m2 • 80 m (262 ft)	YES	YES	POP and retail displays, Textiles (fabric printing), Billboards
	HP Universal Heavyweight Coated Paper, 3-in Core 172 microns (6.8 mil) • 131 g/m2 (33 lbs) • 61 m (200 ft)	YES	YES	POP and retail displays, Posters and photo enlargements
	HP Super Heavyweight Plus Matte Paper, 3-in Core 264 microns (10.4 mil) • 210 g/m2 (55 lb) • 61 m (200 ft)	YES	YES	Trade show and event displays, POP and retail displays, Posters and photo enlargements
	HP Professional Gloss Photo Paper 248 microns (9.8 mil) • 275 g/m2 • 30,5 m (100 ft)	YES	YES	Trade show and event displays, POP and retail displays, Posters and photo enlargements, Interior decorations
	HP Professional Satin Photo Paper 248 microns (9.8 mil) • 275 g/m2 • 30,5 m (100 ft)	YES	YES	
	HP Everyday Satin Photo Paper 187 microns (7.4 mil) • 180 g/m2 • 30,5 m (100 ft)	YES	YES	

Category	Substrate	Automatic printhead alignment	Color calib.	Applications
	HP Matte Litho-realistic Paper, 3-in Core 307 microns (12.1 mil) • 269 g/m2 • 30,5 m (100 ft)	YES	YES	Trade show and event displays, POP and retail displays, Posters and photo enlargements, Art reproductions, Interior decorations
HP Canvas Materials	HP Premium Satin Canvas 462 microns (18.2 mil) •381 g/m2 •22,9 m (75 ft)	NO	NO	Trade show and event displays, POP and retail displays, Posters and photo enlargements, Art reproductions
	HP Everyday Satin Canvas 444 microns (17.5 mil) •340 g/m2 •22,9 m (75 ft)	NO	NO	

- For third-party substrate solutions with ColorPRO technology, see http://ColorPROtechnology.com/.
- HP PVC-free Wall Paper imprimé avec les encres HP Latex est classé A+ selon l'arrêté du 19 avril 2011 «Émissions dans l'air intérieur», qui définit des seuils sur l'émission de polluants volatils posant des problèmes en cas d'inhalation – sur une échelle de A+ (émission très basses) à C (émission élevée).
- HP PVC-free Wall Paper printed with HP Latex Inks is rated A+ according to *Émissions dans l'air intérieur*, which provides a statement of the level of emission of volatile substances in indoor air posing health risks if inhaled—on a scale from A+ (very low emission) to C (high emission).

* HP PVC-Free Wall Paper printed with HP Latex Inks is GREENGUARD Children & Schools Certified. See http://www.greenguard.org/.

* HP PVC-Free Wall Paper printed with HP Latex Inks meets AgBB criteria for health-related evaluation of VOC emissions of indoor building products. See http://www.umweltbundesamt.de/produkte-e/bauprodukte/agbb.htm.

HP large-format substrate take-back program availability varies. Some recyclable HP substrates can be recycled through commonly available recycling programs. Recycling programs may not exist in your area. See http://www.hp.com/recycle/ for details.

D Print-quality troubleshooting summary chart

	Print-quality issues							
Settings	Bleed	Coalescence	Impinging marks	Vertical gloss dotted banding	Burnishing	Smudge	Decell	Scratch
Pre-treatment	▲ *	▲	▼ *	▼ *				
Drying	▲ *	▼ *	▲ *		▲ *			
Curing			▲ *		▲ *	▲ *		▲ *
Density	▼					▼		
Passes	▲		▲		▲	▲	▲	▲
Curing height				▲				
Overcoat								▲
Additional tips		Use composed K					Rotate the image; use spitbars	

▲ Increasing the setting improves print quality

▼ Decreasing the setting improves print quality

* Can impact print quality in other ways

Glossary

Aerosol filter
The printheads produce many fine droplets of ink, most of which are placed accurately on the substrate. However, a small proportion of these droplets escape sideways; the two aerosol filters are placed on either side of the printhead carriage to intercept them.

Bleeding
A print-quality defect that occurs when the ink spreads on the substrate across areas of different colors.

Carriage beam
The beam supporting the printhead carriage as it moves back and forth across the printer.

Coalescence
A print-quality defect that looks like a higher level of whiter grain.

Cockle
A substrate condition in which it is not lying perfectly flat, but rises and falls slightly in shallow waves.

Color accuracy
The ability to print colors that match the original image as closely as possible, bearing in mind that all devices have a limited color gamut and may not be physically capable of matching certain colors precisely.

Color consistency
The ability to print the same colors from a particular print job from print to print and from printer to printer.

Color model
A system of representing colors by numbers, such as RGB or CMYK.

Color space
A color model in which each color is represented by a specific set of numbers. Many different color spaces can use the same color model: for instance, monitors generally use the RGB color model, but they have different color spaces, because a particular set of RGB numbers results in different colors on different monitors.

CSR
Customer replaceable parts.

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

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

ESD
ElectroStatic Discharge. Static electricity is common in daily life. It is the spark when touching the car door, or the cling of clothing. Although controlled static electricity has some useful applications, uncontrolled electrostatic discharges are one of the main hazards to the electronics products. Therefore, to prevent damage some precautions are needed when setting up the product, or handling ESD sensitive devices. This type of damage may reduce the life expectancy of the device or render it unusable. One way to minimize uncontrolled ESDs, and therefore reduce this type of damage is by touching any exposed grounded part of the product (mainly metal parts) before handling ESD sensitive devices (such as the printheads or ink cartridges). Additionally, to reduce the generation of electrostatic charge in your body try to avoid working in a carpeted area,

and keep your body movements to a minimum when handling ESD sensitive devices. Also, avoid working in low humidity environments.

Ethernet
A popular computer networking technology for local area networks.

Firmware
Software that controls your printer's functionality and is stored semi-permanently in the printer (it can be updated).

Gamut
The range of colors and density values reproducible on an output device, such as a printer or monitor.

I/O
Input/Output: this term describes the passing of data between one device and another.

ICC
The International Color Consortium, a group of companies that have agreed on a common standard for color profiles.

Ink cartridge
A removable printer component that stores ink of a particular color and provides it to the printhead.

Ink density
The relative amount of ink that is deposited on the substrate per unit of area.

Ink deposit
The printheads sometimes expel a small amount of ink into the ink deposits in order to check the status of each nozzle.

Ink limits
A means of specifying the maximum amount of ink of all colors in total that can be laid down onto a given substrate.

Ink restrictions
A means of specifying the maximum amount of each color of ink that can be laid down onto a given substrate.

IP address
A unique identifier that identifies a particular node on a TCP/IP network. It consists of four integers separated by dots.

LED
Light-Emitting Diode: a semiconductor device that emits light when electrically stimulated.

Nozzle
One of many tiny holes in a printhead through which ink is deposited onto the substrate.

Passes
The number of passes specifies how many times the printheads will print over the same area of substrate.

Printhead
A removable printer component that takes ink of a particular color or colors from the corresponding ink cartridge(s) and deposits it on the substrate, through a cluster of nozzles.

Printhead cleaning roll
A roll of absorbent material used to clean surplus ink from the printheads after each pass over the substrate.

Spindle
A rod that supports a roll of substrate while it is being used for printing.

Substrate
A thin, flat material made to be printed on.

Substrate-advance belt
A conveyor belt that moves the substrate forwards or backwards.

TCP/IP
Transmission Control Protocol/Internet Protocol: the communications protocols on which the Internet is based.

Tension

Tension is applied at the input and the output side of the printer. It needs to be evenly distributed along the whole width of the substrate, thus substrate loading is a critical operation.

Vacuum pressure

The vacuum applied to the substrate in the printing zone helps to hold the substrate down on the substrate-advance belt, keeping the distance to the printheads constant.

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