HP Latex FS50 / FS60 Printer Series User Guide

SUMMARY

How to use your product.

About this edition

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Edition 1 - November 2024

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1 Introduction

An introduction to your product.

Welcome to your printer

You can use your printer to print signs and graphics on a wide range of flexible materials up to 3.2 m (126 in) in width. It uses water-based HP Latex inks to provide high-quality, durable output.

- Get all of the print quality and none of the smell with the strong, vibrant HP Latex color gamut, and a thin ink layer that preserves the gloss and feel of the substrate.
- Achieve high-quality output with rich colors, 1200 dpi resolution, and 12 picoliter drop size.
- Print on a wide range of substrates—including PVC banners, self-adhesive vinyls, papers, wall coverings, PET films, and textiles.
- Make durable prints with outdoor display permanence of up to three years unlaminated, and up to five years laminated.
- Enjoy accurate and consistent color reproduction with automatic color calibration (built-in spectrophotometer).
- Produce indoor-quality prints at a speed of up to 69 m^2/h (743 ft^2/h).
- Durable and flexible water-based ink provides high adhesion and outstanding scratch resistance with a new HP Latex Overcoat fluid.
- 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 a removable HP Thermal Inkjet printhead 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.
- Advanced engineering can simplify your workflow and reduce reprints with the help of automatic maintenance, assisted loading workflows, automatic print-quality corrections, and unattended flexible printing.
- Increase uptime with this smart printer.

Printer accessories and consumables

A list of items you can purchase for use with your printer.

Table 1-1 Accessories

Product number	Product name
3Y0K4A	HP Latex FS50/FS60 Series Ink Collector Kit

Table 1-1 Accessories (continued)

Product number	Product name
474Y0A	HP Latex FS50/FS60 Series Ink Collector Foams Kit
474X9A	HP Latex FS50/FS60 Series Jumbo Dual Roll Kit
9S7Z8A	HP Latex FS50/FS60 Series High Capacity Ink Kit
79D06A	HP Latex FS50/FS60 Series Edge Holder Kit
4BS24A	HP Latex R Series & FS50/FS60 Cleaning Kit
55P22A	HP Latex FS50/FS60 Series User Maintenance Kit
55P20A	HP Latex FS50/FS60 Standard Uptime Kit
55P21A	HP Latex FS50/FS60 White Uptime Kit
4J0X0A	HP 126-in Dual Roll Kit
4R4W4A	HP 126-in Spindle
4R4W7A	HP 126-in Diverter Roller
4R4W5A	HP Latex 126-in Roll-to-freefall Kit
M2J33	HP Latex In-line Slitters
T4E58B	HP Latex Media Saver Kit

Table 1-2 Consumables

Product number	Product name
G0Z28A	HP 883 5-liter Cyan Latex Ink Cartridge
G0Z29A	HP 883 5-liter Magenta Latex Ink Cartridge
G0Z30A	HP 883 5-liter Yellow Latex Ink Cartridge
G0Z31A	HP 883 5-liter Black Latex Ink Cartridge
G0Z32A	HP 883 5-liter Light Cyan Latex Ink Cartridge
G0Z33A	HP 883 5-liter Light Magenta Latex Ink Cartridge
G0Z34A	HP 883 5-liter Optimizer Latex Ink Cartridge
G0Z35A	HP 883 5-liter Overcoat Latex Ink Cartridge
8G4G4A	HP 883 5-liter Overcoat B Latex Ink Cartridge
G0Z44A	HP 883 3-liter White Latex Ink Cartridge
9J0R1A	HP 893 10-Liter Cyan Latex Ink Cartridge
9J0R2A	HP 893 10-Liter Magenta Latex Ink Cartridge
9J0R3A	HP 893 10-Liter Yellow Latex Ink Cartridge
9J0R4A	HP 893 10-Liter Black Latex Ink Cartridge
9J0R5A	HP 893 10-Liter Light Cyan Latex Ink Cartridge
9J0R6A	HP 893 10-Liter Light Magenta Latex Ink Cartridge
9J0R7A	HP 893 10-Liter Overcoat Latex Ink Cartridge

Table 1-2 Consumables (continued)

Product number	Product name
9J0R8A	HP 893 10-Liter Optimizer Latex Ink Cartridge
9J0R9A	HP 893 10-Liter Overcoat B Latex Ink Cartridge
G0Z21A	HP 886 White Latex Printhead
G0Z22A	HP 886 Optimizer Latex Printhead
G0Z24A	HP 886 Latex Printhead
G0Z45A	HP 886 Latex Printhead Cleaning Kit

Documentation and useful links

Full documentation is available for your printer.

The following documents can be downloaded from http://www.hp.com/go/latexfs50-60/manuals:

- Site preparation guide and checklist
- Installation guide
- Introductory information
- User guide (this document)
- Legal information
- Limited warranty

Further information is available from http://www.hp.com/go/latexfs50-60/support.

Videos and other training materials are available from:

- http://www.hp.com/supportvideos
- http://www.youtube.com/HPPrinterSupport
- https://lkc.hp.com/blog/hp-latex-fs-printer-series-training

See the Solutions website at http://www.hp.com/go/latexfs50-60/support for information about new substrates. A Web-based Media Locator at 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.

Safety precautions

Before using your printer, read the following safety precautions and operating instructions 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

Please read these safety guidelines carefully.

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

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.

General cleaning instructions

Follow these instructions whenever you find in this guide no specific instructions for cleaning a particular part.

For general cleaning, a lint-free cloth dampened with distilled water is recommended. Let the cleaned part dry, or use a dry cloth to dry it completely.

Do not spray fluids directly onto the HP product. Spray the fluid onto the cloth used for cleaning.

To remove stubborn dirt or stains, moisten a soft cloth with water and a neutral detergent, or general-purpose industrial cleaner (such as Simple Green industrial cleaner). Remove any remaining soap foam with a dry cloth.

For glass surfaces, use a soft, lint-free cloth lightly moistened with a non-abrasive glass cleaner or with general purpose glass cleaner (such as Simple Green glass cleaner). Remove any remaining soap

foam with a lint-free cloth dampened with distilled water and dry the surface with a dry cloth to prevent spotting.

⚠ **CAUTION:** Do not use abrasives, acetone, benzene, sodium hydroxide, or carbon tetrachloride on the glass: they can damage it. Do not place or spray liquid directly onto the glass: the liquid could seep under the glass and damage the device. You can use a canister of compressed air to remove dust from electronic/electrical parts.

⚠ **CAUTION:** Do not use a water-based cleaner on parts with electrical contacts: it could damage electrical circuits.

⚠ **CAUTION:** Do not use wax, alcohol, benzene, thinner, ammonia-based cleaners, or other chemical detergents, which could damage the product or the environment.

NOTICE: In some locations the use of cleaner products is regulated. Ensure that your cleaner complies with federal, state, and local regulations.

Electric shock hazard

Take these precautions to avoid the risk of electric shock.

⚠ **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.

Also take the following precautions:

- Do not attempt to dismantle the drying and curing modules or e-cabinet 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 Current Circuit Breaker every year (see 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.

Check the functionality of the Residual Current Circuit Breakers (RCCBs)

Following standard 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 array supports, beam, and enclosures can reach high temperatures.

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

- 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 LED array supports, beam, and enclosures.
- Do not attempt to modify LED array supports, beam, and enclosures.
- Remember to let the printer cool down before performing some maintenance operations.

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 e-cabinet.
- 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.

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.
- Do not place objects covering LED array supports, beam, and enclosures.
- Take care not to spill liquid on the accessory. After cleaning, make sure all components are dry before using the printer.
- Do not attempt to modify LED array supports, beam, and 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 and the (optional) in-line slitters.

- 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 or moving rolls during printing.
- Do not operate the printer with covers bypassed.
- Do not touch the in-line slitters during printing.
- Handle the in-line slitters with care and store them safely into their box when not used with the printer.
- Risk of cutting your fingers! Uninstall the in-line slitters when manipulating the curing module or accessing the substrate path.
- Take care when using the air gun. When used for cleaning purposes, make sure to use it according to the local regulations since additional safety provisions may apply.

⚠ WARNING! Be careful when you open the loading table; **never** leave it unattended with both latches in the open position. It may open inadvertently and cause serious injuries. Always check that it has both latches closed properly.

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.

Sound pressure level

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

Chemical hazard

Sufficient ventilation should be provided to ensure that potential airborne exposure to these substances is adequately controlled.

See the safety data sheets available at http://www.hp.com/go/msds to identify the chemical ingredients of your consumables. Consult your usual air-conditioning or EHS specialist for advice on the appropriate measures for your location. For more detailed information, see the "Ventilation" section of the site preparation guide.

Heavy substrate hazard

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

- Handling heavy substrate 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.

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

Follow the ventilation recommendations in the site preparation guide.

⚠ **CAUTION:** The ventilation units should not blow air directly onto the printer.

Air conditioning

Air conditioning in the work area should take into account that the equipment produces heat.

In addition to fresh air ventilation, to avoid health hazards, also consider maintaining workplace ambient levels by assuring the climatic operating conditions specified in this document (see Environmental specifications on page 343) to avoid operator's discomfort and equipment malfunction. Typically, the printer's power dissipation is 11 kW (37.5 kBTU/h).

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

Use of tools and keys

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

- **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, e-cabinet key, mains switch key, internal print server key, and Torx screwdriver set.

Table 1-3 **Tools and keys**

Maintenance	E-cabinet	Main switch
		
Maintenance key	E-cabinet key	Mains switch key
		
Internal Print Server 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. No-one should be allowed to use the printer without this training.

Warnings and cautions

Symbols are used in the user guide 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

This topic provides a full set of reference information for this subject.

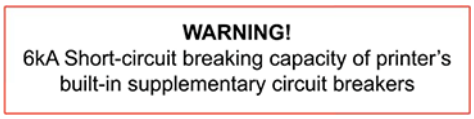
Table 1-4 Warning labels

Label	Explanation
 Located on the e-cabinet.	**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 universal support beam	Risk of burns. Do not touch the internal enclosures of the printer's drying and curing modules, universal support beam, and LED array and enclosures when accessing substrate path.
 Located on each side of substrate path, close to PPS gear	Crush hazard. Do not touch PPS while moving. When substrate has been loaded, the carriage descends into its normal position, and could crush your hand or anything else left underneath it.
 Located on each side of substrate path, and close to PPS gear	Risk of trapped fingers. Do not touch gears while moving. Danger that your hands may become trapped between gearwheels.

Table 1-4 Warning labels (continued)

Label	Explanation
 Located internally on substrate path and on printhead cleaning roll; for maintenance/service personnel only	Hazardous moving part. Keep away from moving carriage printhead. When printing, the printhead carriage travels back and forth across the substrate.
	You are recommended to wear gloves when handling the maintenance cartridge, the platen, the ink collector, the condensates, and the condensate system components.
 Located on rear side on left cover	Sound pressure level could exceed 70dB(A) in certain print modes. Hearing protection may be required.
 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 PCA cooling fan; for maintenance/service personnel only	Hazardous moving parts. Keep away from moving fan blades. Internal close to vacuum-fan blades and dryer-PCA cooling fan.
 Located on each side of the in-line slitters and close to carriage encoder strip	Risk of cutting your fingers. Do not touch in-line slitters during printing. Handle in-line slitters with care and store them safely in their box when not being used with the printer.

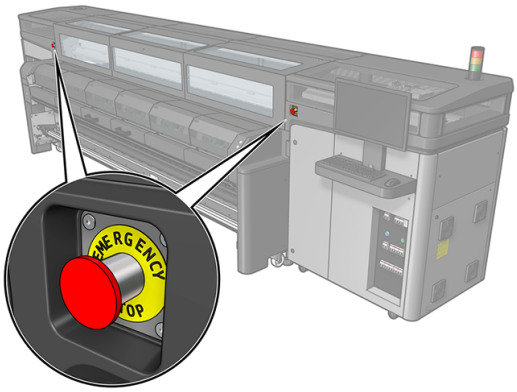
Table 1-4 Warning labels (continued)

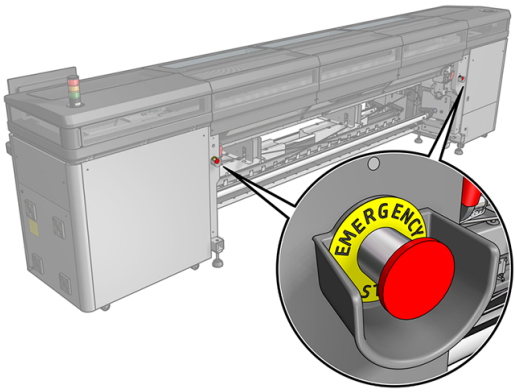
Label	Explanation
	Identifies the Protective Earth (PE) terminal for the qualified electrician, and bonding terminals for maintenance/service personnel only. Earth connection essential before connecting supply.
	Identifies the Protective Earth (PE) terminal for the qualified electrician, and bonding terminals for maintenance/service personnel only. Earth connection essential before connecting supply.
	Identifies the short-circuit breaking capacity of printer's built-in supplementary circuit breakers beside mains input terminal, for qualified electrician 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.





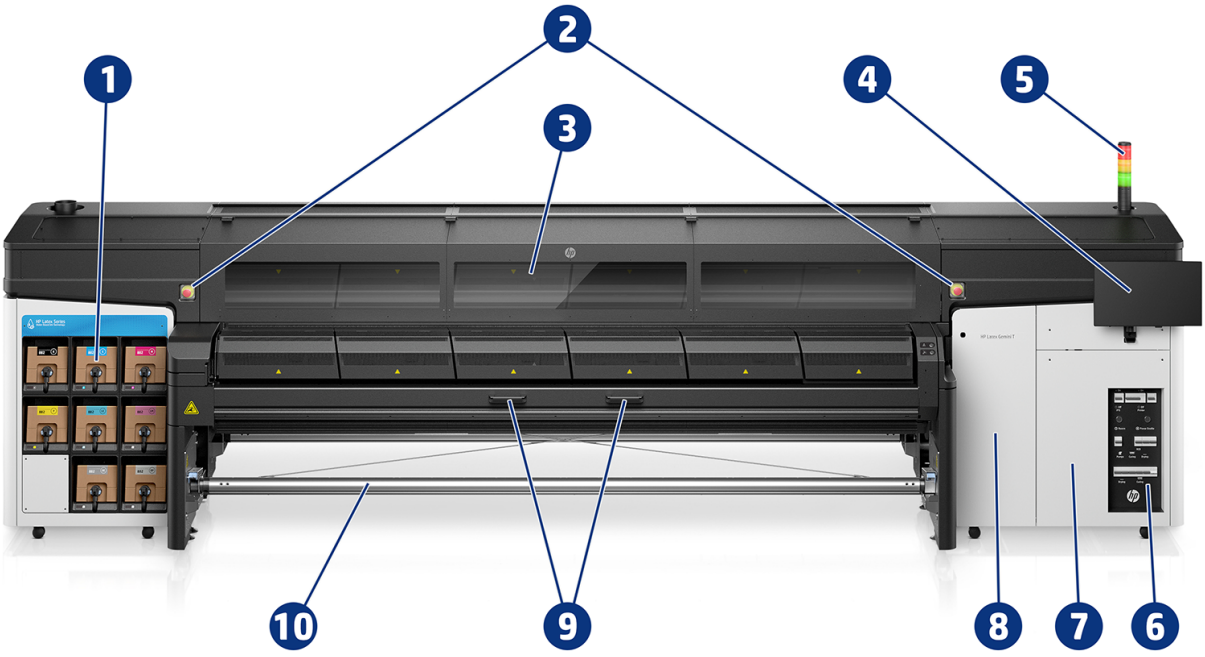
For safety reasons, access to the print zone is not permitted while printing is in progress. Therefore, if the window or the loading table is opened, power to the carriage and to the drying and curing module is disconnected. The print is cancelled and a system error may be displayed.

Main components

The following views of the printer illustrate the main components.

Front view

These are the printer components visible from the front.

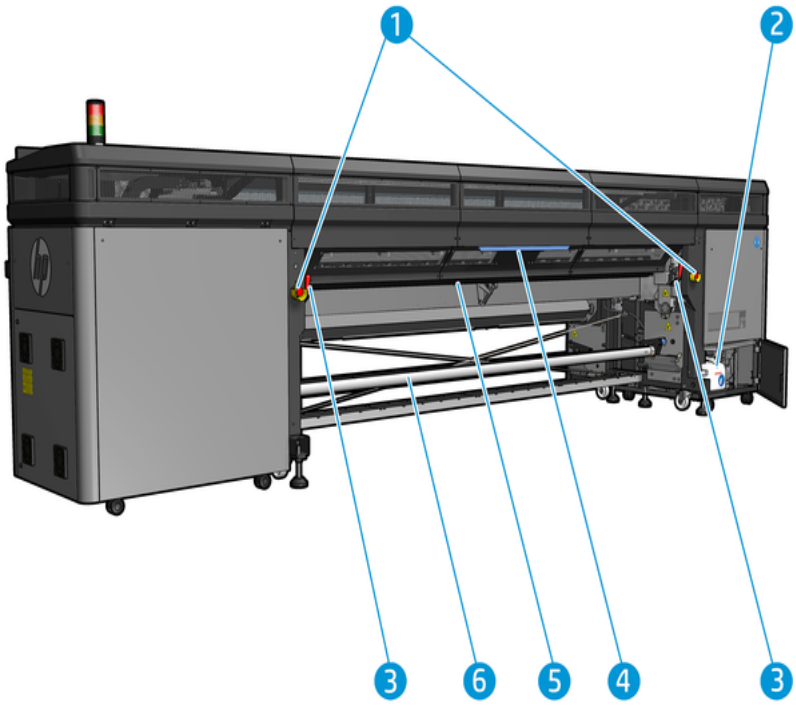


1. Ink cartridges
2. Emergency stop buttons
3. Front window (for carriage and print-zone access)
4. Touchscreen (for Internal Print Server access)
5. Printer status beacon

6. Power switches, lights, and circuit breakers
7. E-cabinet
8. Printhead cleaning roll door
9. Curing module handles
10. Substrate output spindle

Rear view

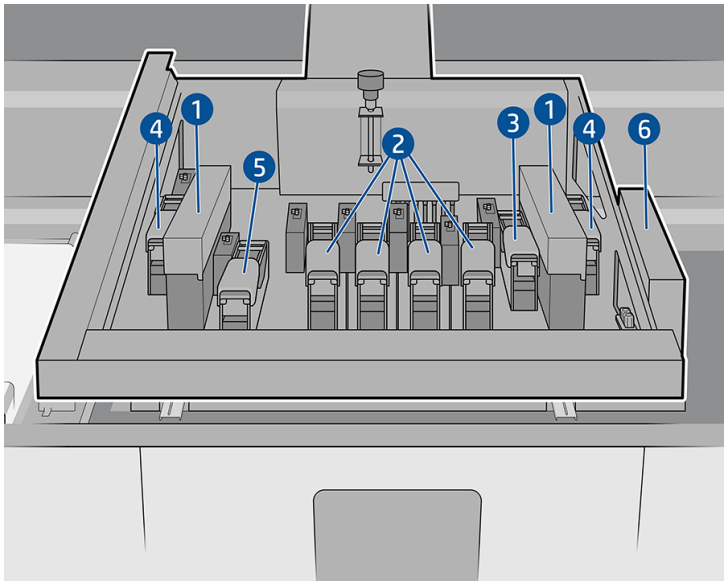
Overview of the rear of the printer's main hardware components.



1. Emergency stop buttons
2. Condensation collector bottle
3. Loading table latches, one on each side
4. Loading table
5. Drive roller
6. Substrate input spindle

Carriage view

These are the components of the printhead carriage.



1. Aerosol filters
2. Color printhead
3. Color printhead (2700 and FS50/FS60 printers)

   White/CK printhead (2700W printer and FS50 W/FS60 W printers)
4. Optimizer printhead
5. Overcoat printhead
6. CK storage box (2700W and FS50 W/FS60 W printers only)

Printer software

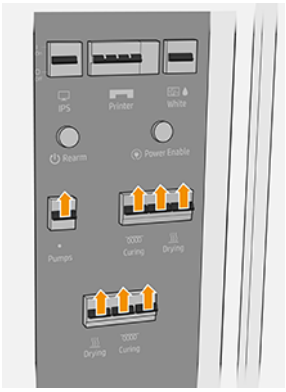
Your printer requires two items of software.

- The HP Internal Print Server is provided with your printer and is already installed. It displays printer alerts on the printer's touch screen, 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 28.
- 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

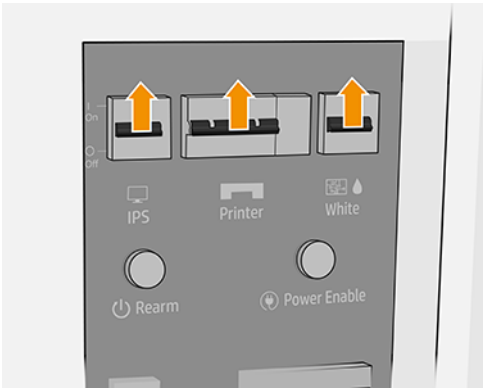
The following steps provide the complete procedure for this topic.

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. Make sure that no emergency stop button is pressed (see Emergency stop buttons on page 12).

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



4. 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.

5. Tap the power button (insert button icone) displayed by the Internal Print Server. Wait for the Internal Print Server to tell you that the printer is waiting for rearm.

6. Perform a visual check of the printer.

7. Press the blue rearm button at the front right of the printer. This enables all of the printer's high-power subsystems.

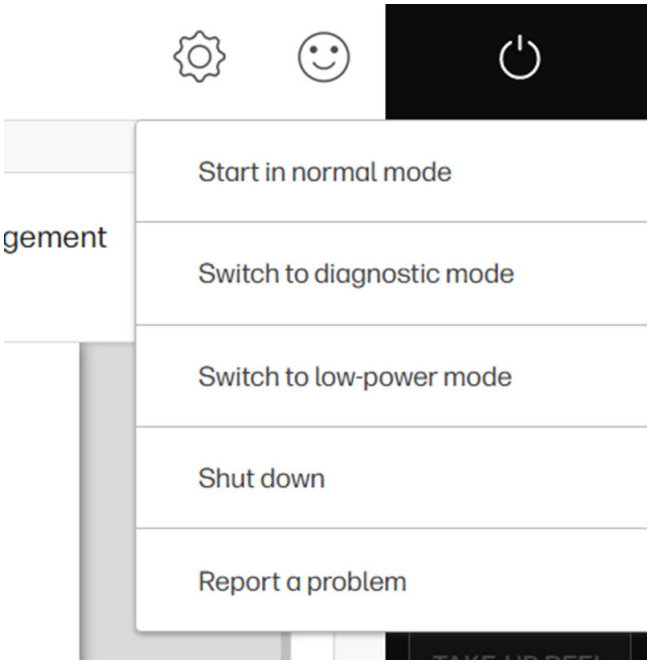
8. Check that the printer-enabled green light turns on. In normal operation this light should always be on.

9. 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

For the purposes of normal use, the printer can be turned on and off from the Internal Print Server.

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



Power levels

1. **Start in normal mode.** The printer is on.
2. **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.
3. **Switch to low power mode.** Low power mode preserves the white ink channel. After restarting in low power mode, you should turn off the e-box switches.
4. **Shut down.** The printer is off.

⚠ CAUTION: The FS50 W/FS60 W printer should not be shut down for more than 4 hours, because then the white system cannot recirculate.

Recommended states to leave the printer in overnight

These instructions include recommendations for leaving printers on overnight or extended periods out of use. There are several options depending on the printer model and the customer's workflow.

Recommendations by printer model

Latex 2700 and FS50/FS60:

- Machine off
- Machine on (only turbo configuration available)

Latex 2700W and FS50 W/FS60 W:

▪ Low power mode in Turbo configuration

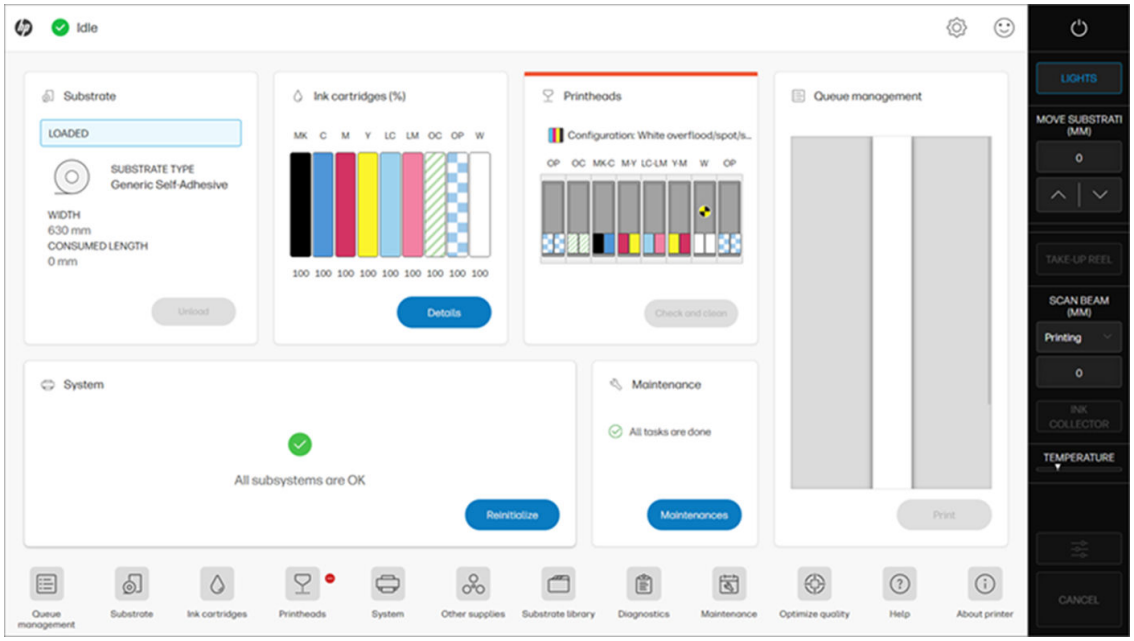
▪ Low power mode in White configuration (to avoid configuration changes)

To maximize the life of white printheads, we highly recommend you:

- Remove the white printhead and store it in the wheel

- Insert the jumper on the FI tower (as when printing in turbo) to allow white recirculation

- Keep the CK printhead in the storage box

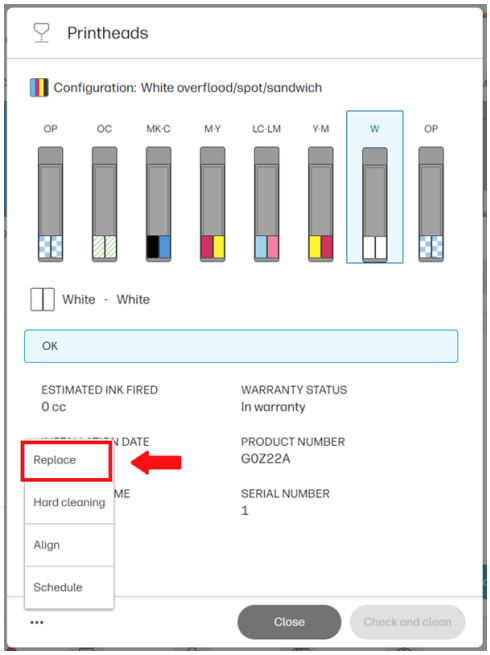


NOTE: The status may be marked in red in Printheads, like an error. This indicates that the printer is not ready to print. It does not mean that there is any risk for the printer or operators. With the jumper installed, white recirculation will take place.

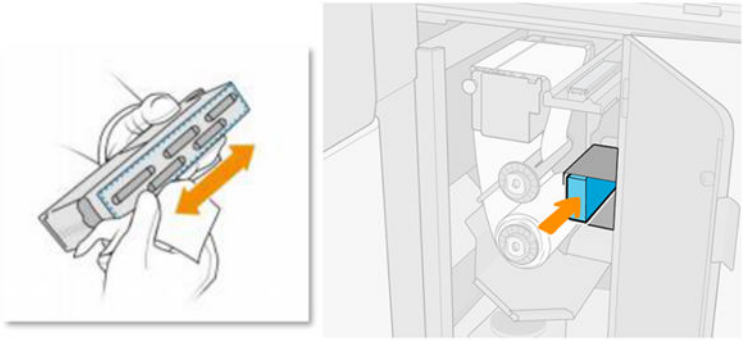
Latex 2700W and FS50 W/FS60 W in white configuration overnight

Follow this procedure step-by-step.

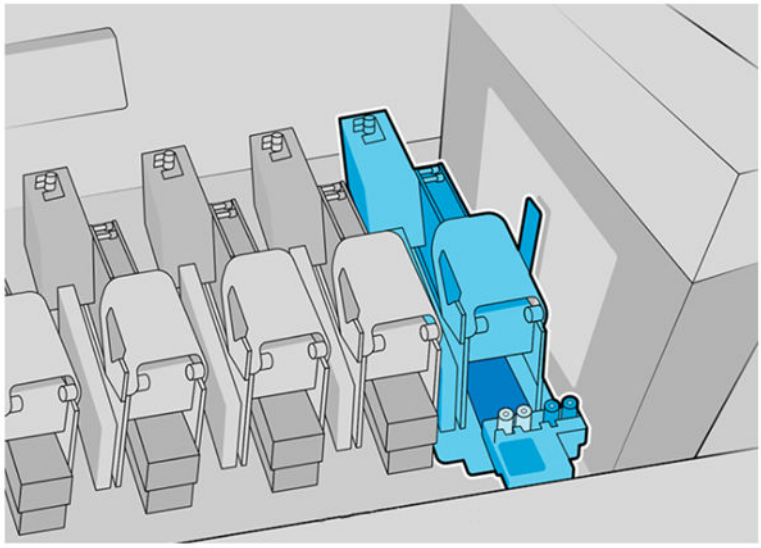
1. Enter the “Replace” widget to remove the white printhead: Printhead Replace.



2. Put the white printhead in the storage box, and then in the rotating chamber. Remember to clean the printhead before putting it in the wheel:



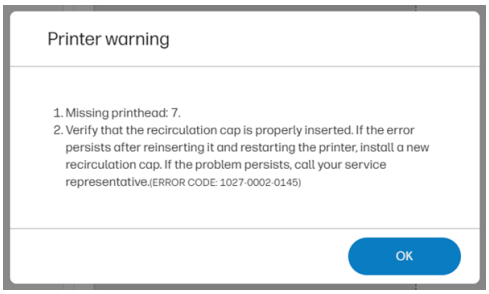
3. Close the white/CK printhead latch (without any printhead inserted).



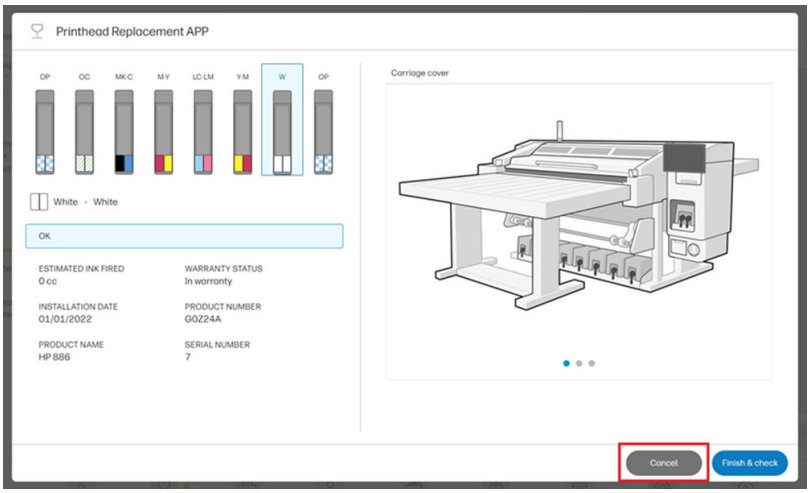
4. Insert the jumper in the white FI tower.

IMPORTANT: White ink recirculation will not be possible if this jumper is not in place. This could compromise the white ink system.

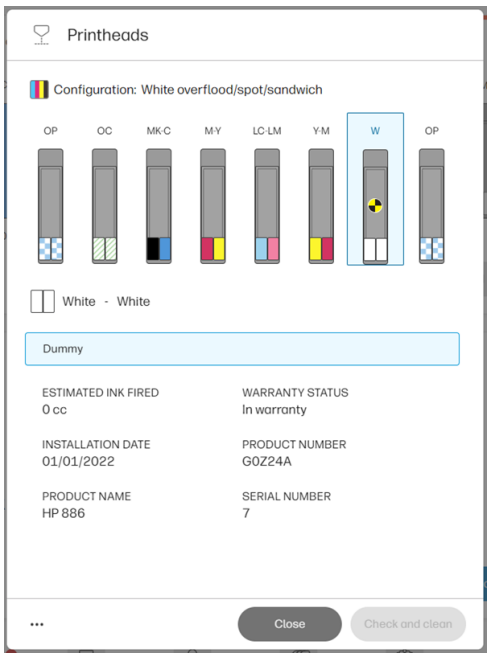
IMPORTANT: If the jumper is not positioned properly, this error will appear after a few minutes.

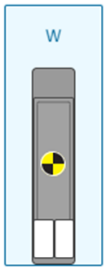


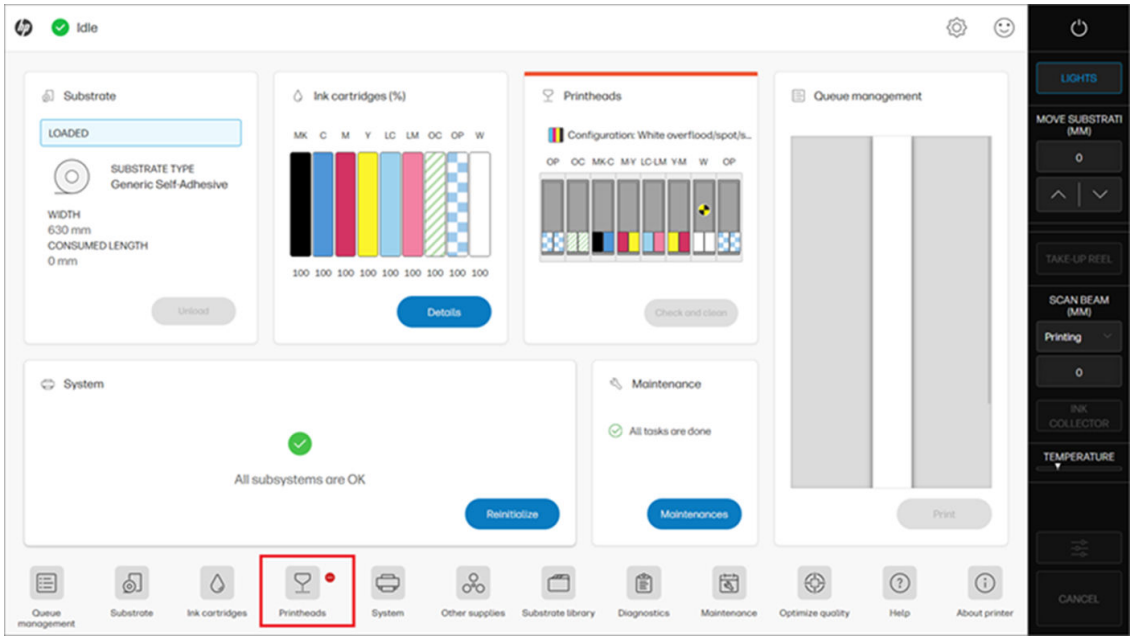
5. Close the carriage cover and select 'Cancel,' as we already know there is a printhead missing.



6. The printer will show a different icon once the jumper is detected to indicate the printheads is not installed. This could take a few seconds. This icon means the printer is in a safe state but it cannot print. This icon is the same used in R Series when the dummy printheads are installed. For the FS50 W/FS60 W printer, the installation of the recirculation jumper does the same function as the dummy printheads.

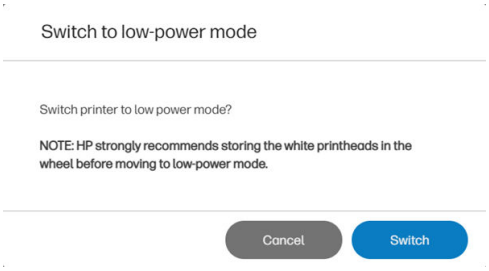




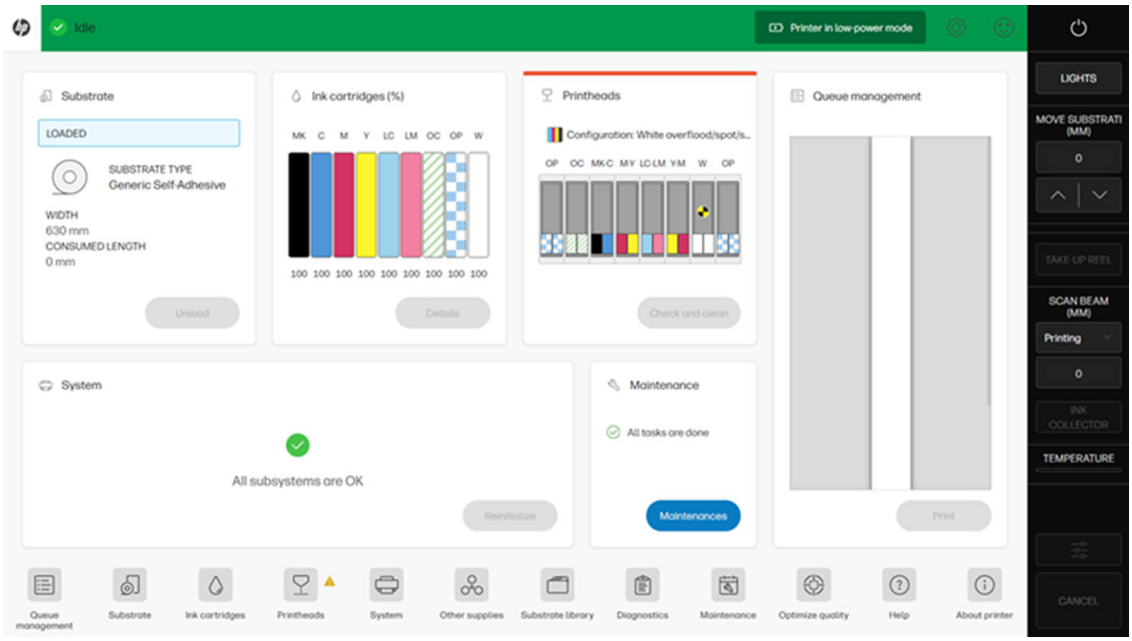


NOTE: The status may be marked with a red cross, like an error. This indicates that the printer is not ready to print. It does not mean that there is any risk for the printer or operators. With the jumper installed, white recirculation will take place and the carriage will not move with an empty slot.

7. Switch the printer to low-power mode to reduce power consumption overnight. The printer will remind you to remove the PH any time you switch to low power mode when in any white configuration:

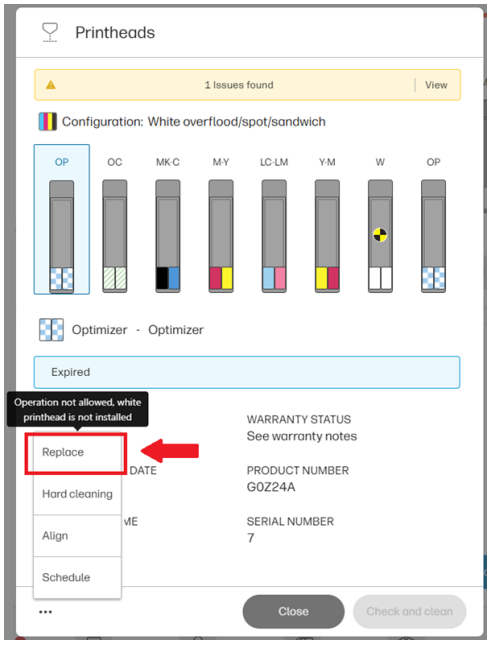


8. The printer will stay in low-power mode at night or during the period that is not needed. This is indicated by the beacon blinking green.

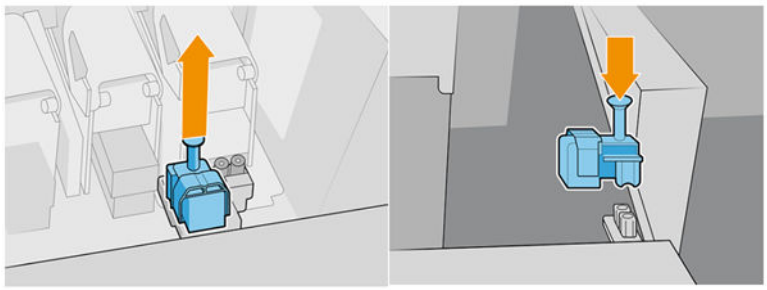


9. To resume production, switch the printer to normal mode.

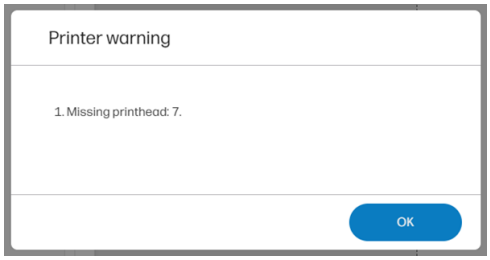
NOTE: When the printer is Idle, you may notice you are not allowed to print or to enter the replace widget because a Printhead is missing, first you need to insert the PH.



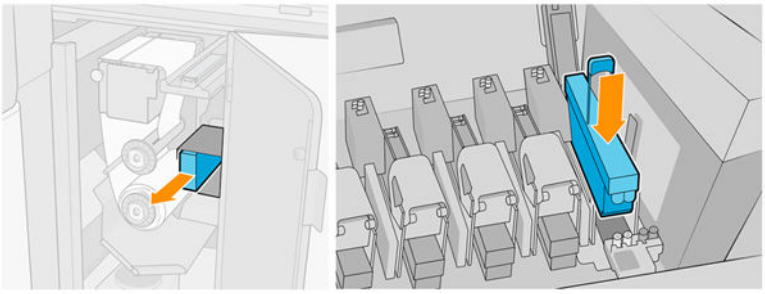
10. Open the cover and remove the jumper from the FI tower.



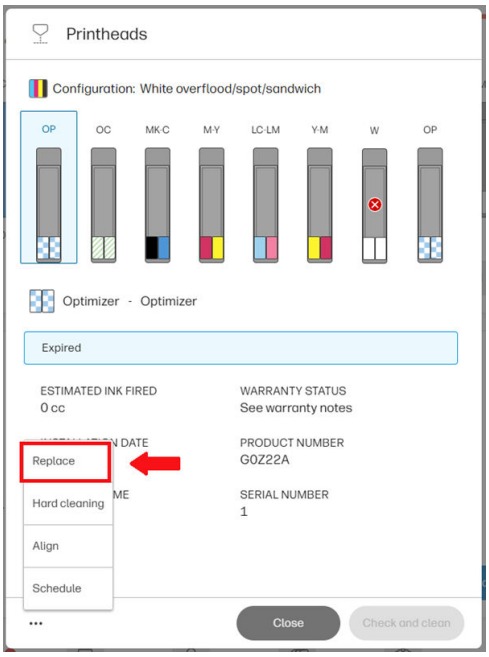
NOTE: When you open the cover an error saying that the Printhead 7 is missing may appear.



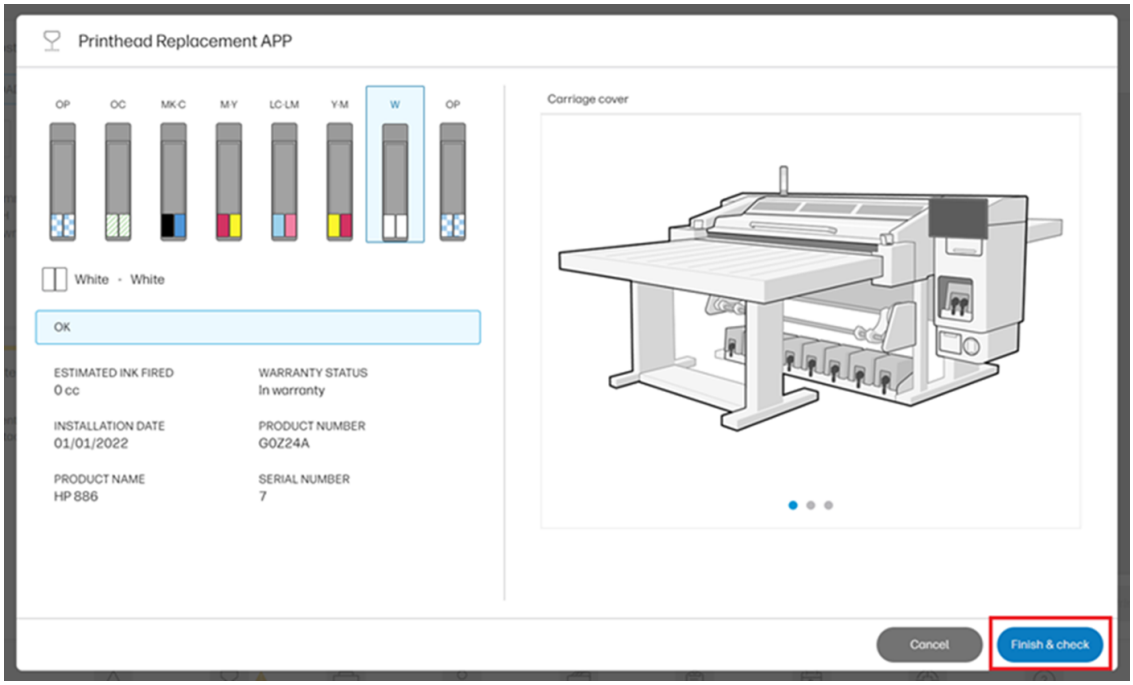
11. Take the white printhead from the rotation chamber and insert it. Before inserting the PH, make sure that the FI tower is in the proper position.



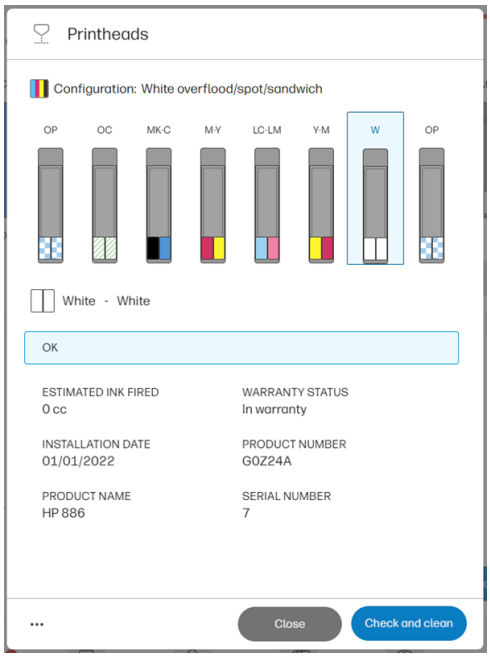
12. To complete the process of inserting the white printhead, go to Printheads Replace.



13. Select ‘Finish & check’ to complete the process.



14. Run ‘Check and Clean’ before starting production.



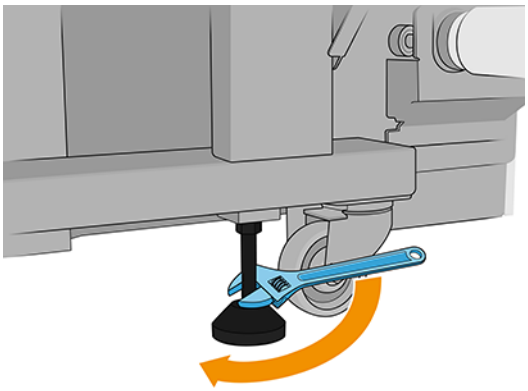
15. Printer is ready for production.

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, follow these instructions. For more difficult movement operations, contact your service representative.

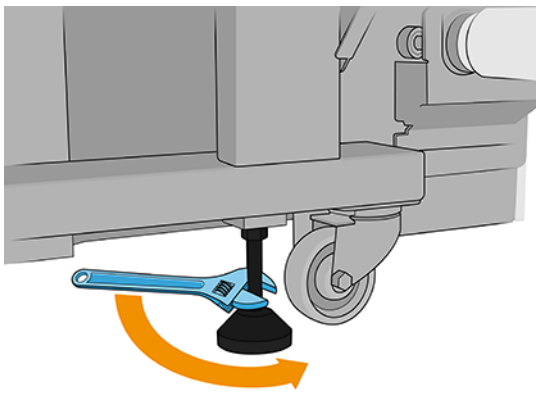
⚠ **CAUTION:** Slopes steeper than 3% may cause serious damage to the printer.

1. Turn off the printer.
2. Disconnect all power and network cables from the printer.
3. If the heavy-duty-roll accessory is installed, remove the anchor kit.
4. 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-ended 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-ended 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-ended 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.



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

6. 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.

Printer status beacon

The printer status beacon is on top of the printer. It gives you an indication of the status of the printer that is visible from a distance.

⚠ **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.

Table 1-5 Meaning of printer status beacon lights

Color	Description
Red	Unexpected printing interruption. A job that had started to print stopped unexpectedly and appears as **Failed**. Attention required.
Orange	Warning alert present in the Internal Print Server
Green, blinking	Printing
Green, steady	Idle

2 HP Internal Print Server

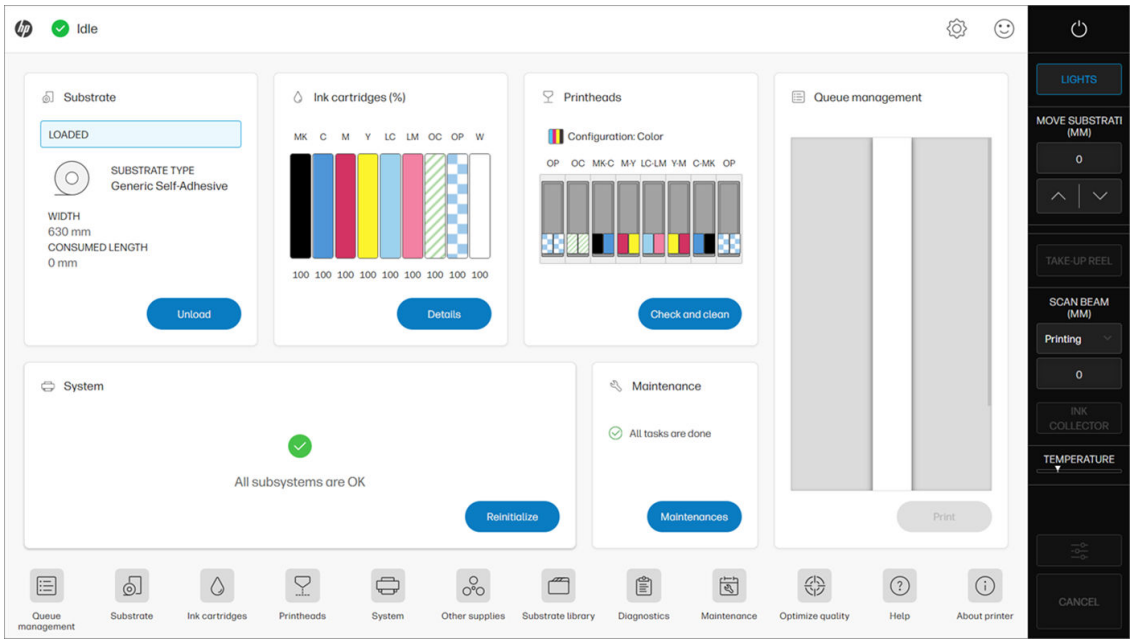
The following sections provide details for this topic.

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.



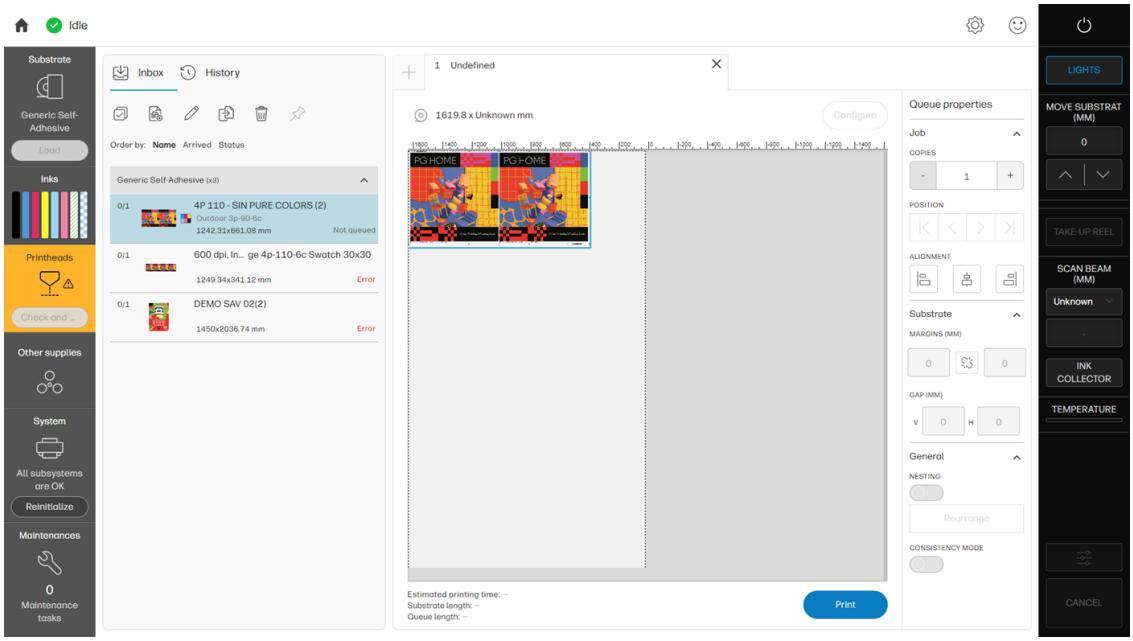
The main window is divided between different widgets, with which you can view and manage the operation of the printer:

- 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.

  To start a queue, select jobs from the Inbox on the left, and drag and drop the selected jobs to the right.

TIP: You can select several jobs and drag them at the same time.

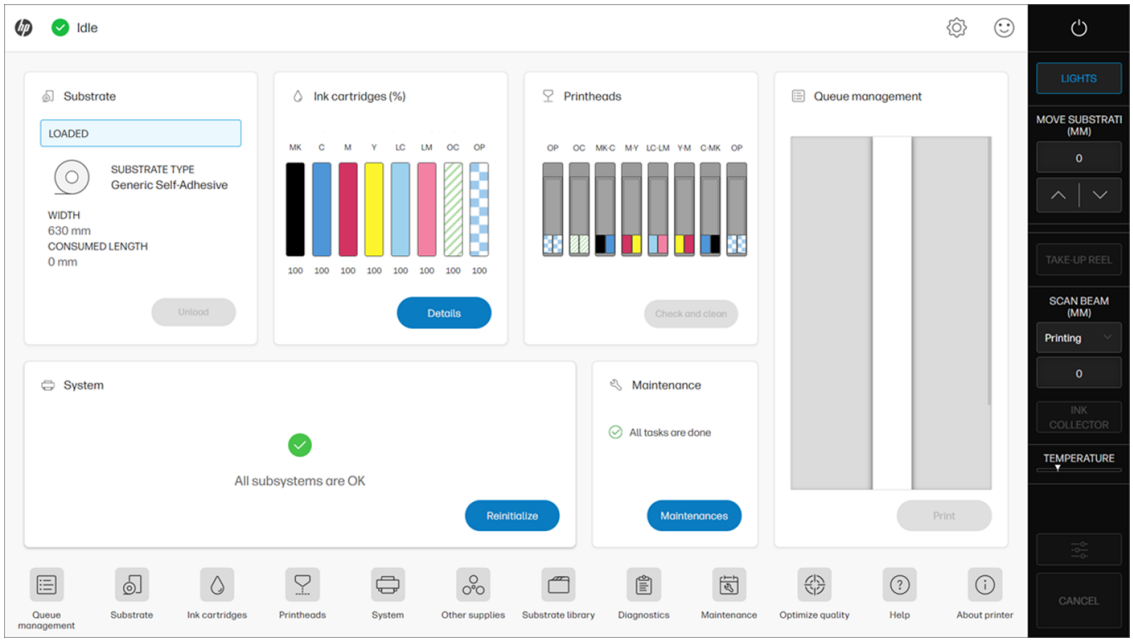
- Most of the right half of the window is occupied by the preview of the different queues, with settings and selected jobs.
- The vertical bars on each side of the window provide further information and action buttons: the same buttons that exist on the printer, but with more options.
- In the **History** tab, you will find information about the jobs that you have recently printed.
- For complete accounting, register your printer 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 and the size of the loaded substrate.
- The **Ink cartridges** 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 **Printheads** 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 **Queue management** widget shows the status of the printer and the job queues.
- 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 29).

Tap the widget for more information about the alert.

Update the printer's firmware and software (Internal Print Server)

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

IMPORTANT: HP recommends an external LAN connection for this procedure, as it allows you to automate some procedures, and simplifies the process. The following sections provide instructions for each situation.

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

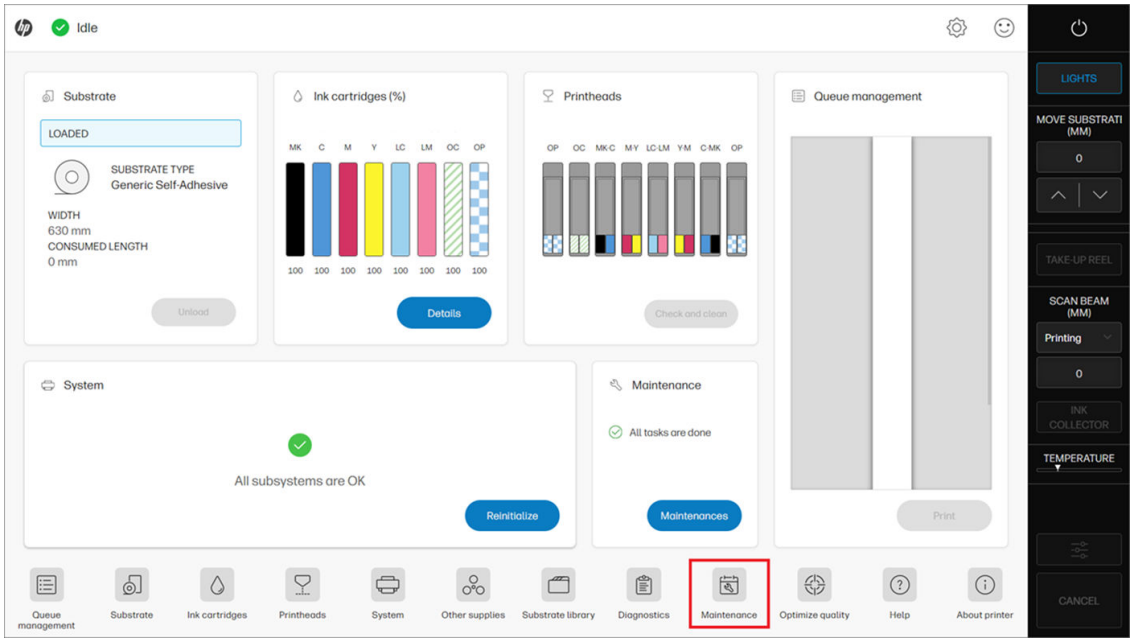
Automatic firmware and software updates

When a LAN connection is available, the Internal Print Server periodically checks whether a new update package has been published by HP.

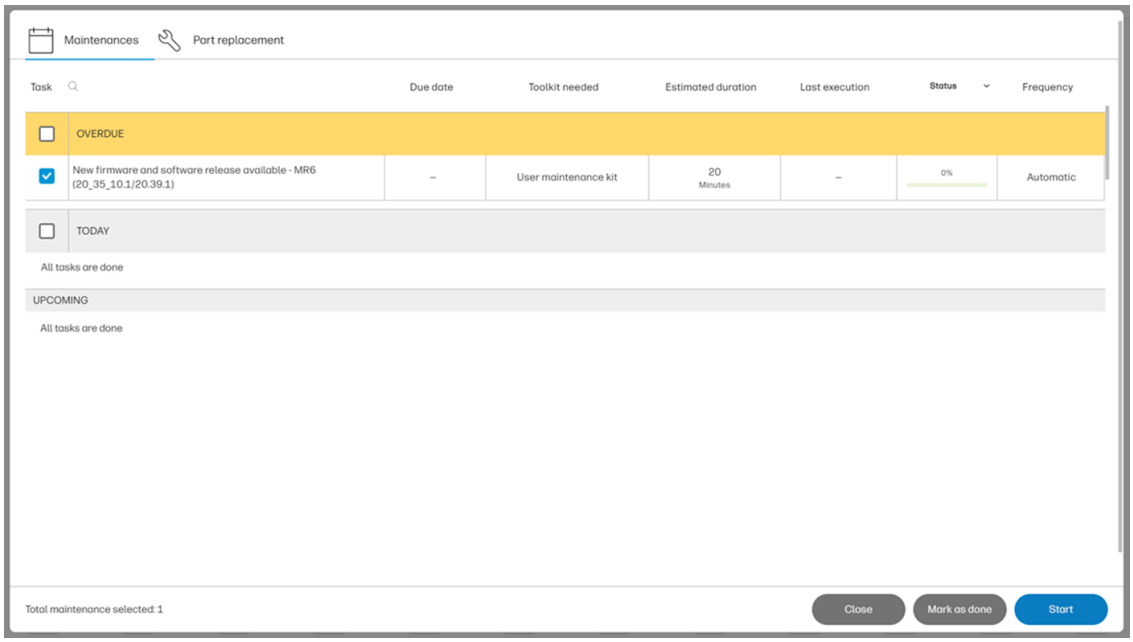
If a new update is available, it is automatically downloaded and presented in the Internal Print Server as a “New firmware and software release”, visible in the Maintenances window.

When the Internal Print Server computer is started for the first time, it takes a few minutes to download the update package and display the notice in the Maintenances window.

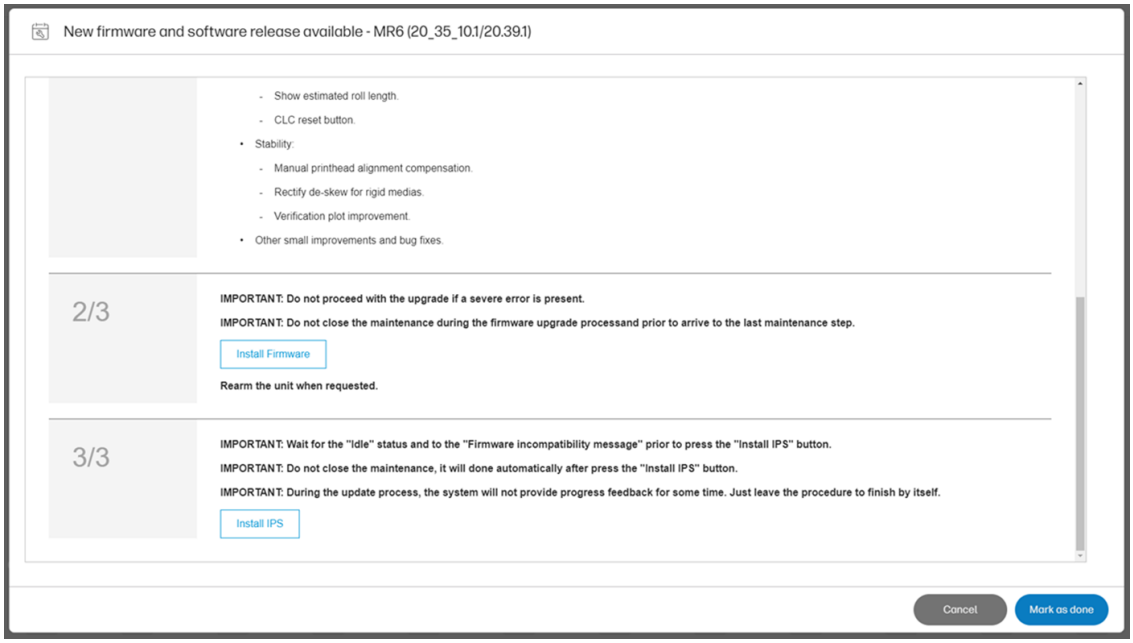
1. Tap **Maintenances** to display the list of maintenances.



2. Tap the new firmware and software release to view the instructions.

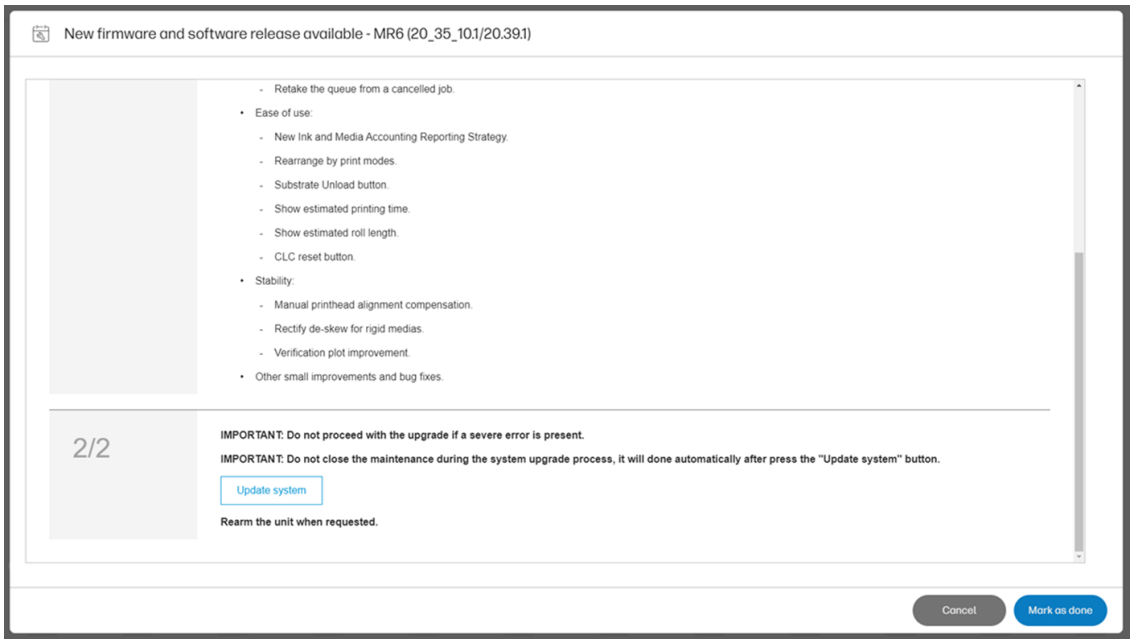


3. You may need to update the firmware and the Internal Print Server from two different buttons.



IMPORTANT: In this case, update the firmware first, then the Internal Print Server. After updating the firmware, do not forget to update the Internal Print Server.

4. Alternatively, one button may be provided to update both.



The printer will restart during the upgrade process, and the Internal Print Server will close and restart. Eventually the Internal Print Server computer will also need to be restarted.

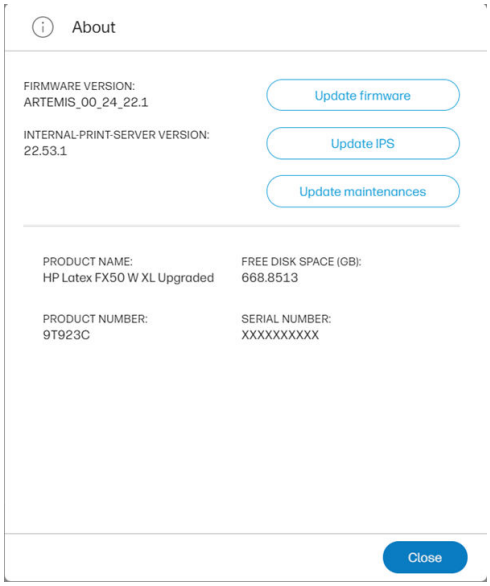
Manual firmware and software updates

The system may be manually updated for any reason, typically when it has no LAN connection.

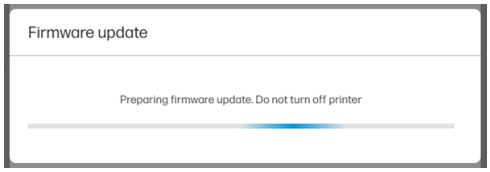
Firmware, Internal Print Server, and maintenance updates can be downloaded from the Internet and installed in your printer using the Internal Print Server.

1. Download the latest update files from the hp.com website onto your computer's hard disk (preferably in a dedicated folder, not on the desktop) and unzip all the files. You will find three files: a firmware package (*.fmw), an Internal Print Server installer (HPIPS-*-installer.exe) and a maintenance installer (HPIPS-*-Maintenances.exe).
2. Copy the three files to a USB device, placing them in the same folder. Plug the USB device into the socket on the Internal Print Server monitor.

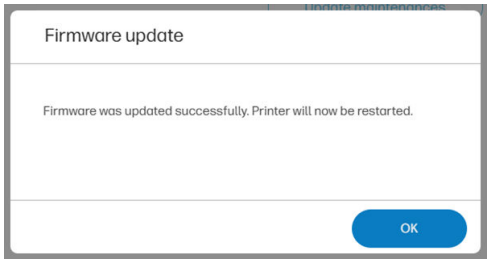
3. At the bottom of the Internal Print Server's home screen, tap the **About** icon to open the **About** window.



4. Tap **Update firmware**.
5. A file browser window opens. Navigate to the USB device and look for the firmware update file. Select it by tapping **Open**.
6. The firmware is uploaded to the printer. A progress bar is displayed while it is uploading.



7. On completion, the Internal Print Server displays a message confirming the update. Tap **OK** to continue. At this point, the printer should restart without any interaction. If it does not, restart the printer manually.



NOTICE: The first restart after the firmware update takes more time than usual.

8. Back in the **About** window, tap **Update IPS**.
9. A file browser window opens. Navigate to the USB device and look for the IPS update file. Select it by tapping **Open**.

10. The window closes and the installer starts. Follow the onscreen instructions until the new Internal Print Server is installed.

11. If the maintenance update file is in the same folder as the IPS update file, the Internal Print Server installer also installs the maintenance update. However, if you need to install the maintenance update separately for some reason, you can do so as follows.

    a. Back in the **About** window, tap **Update maintenances**.

    b. A file browser window opens. Navigate to the USB device and look for the maintenance update file. Select it by tapping **Open**.

    c. The maintenance installer starts. Follow the onscreen instructions until it finishes.

Internal Print Server settings and preferences

To change the settings or preferences, tap the Settings icon and access the appropriate menu.

NOTE: The language of the HP Internal Print Server can be changed in the settings. But the language and other setting of the Windows can not be modified because it could affect the correct behavior of the HP Internal Print Server Application.

3 RIP distribution

HP RIP Certification differentiates the RIP partners who reach a specific and superior level of integration, compatibility, and performance with the printer.

The certified RIP partners and versions are Caldera 17 and ONYX 24, for both of which the Configuration Center is Web-based and not RIP-dependent.

4 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:

- CalderaRIP 17 software
- ONYX 24 RIP software

You need only one of these.

The communication between the RIP and the Internal Print Server is performed through a hot folder that is created by the Internal Print Server installer. The default hot folder path is **C:\output**.

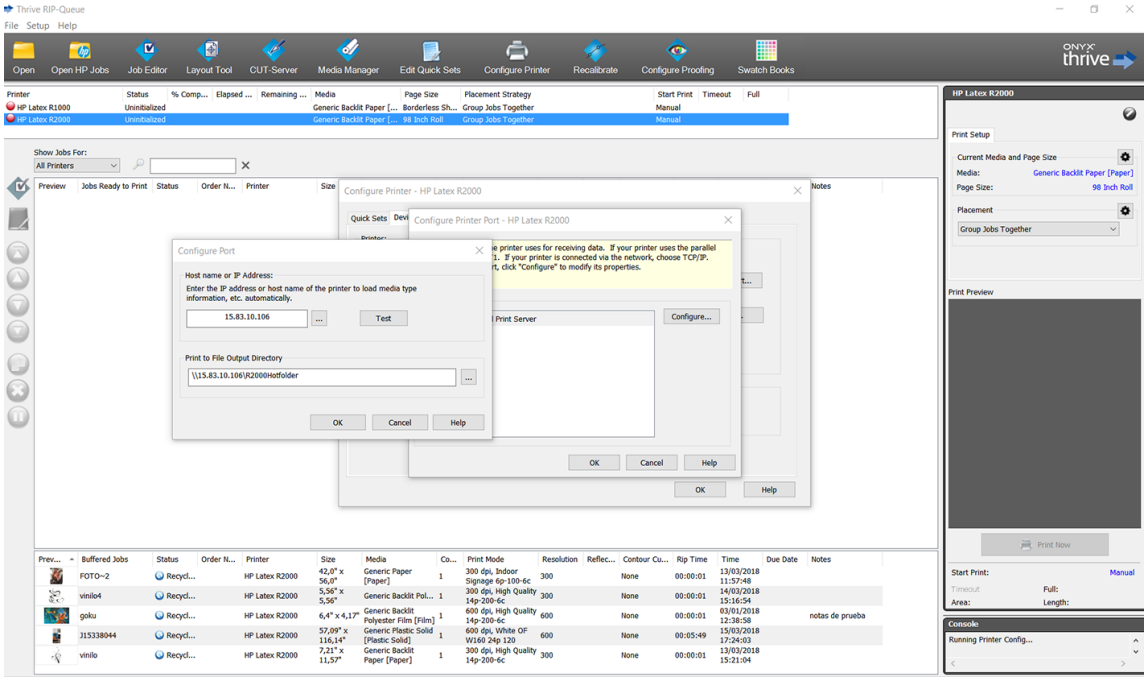
This configuration can be changed in **IPS** > **Preferences** > **Connectivity**.

Install ONYX software and set up the driver

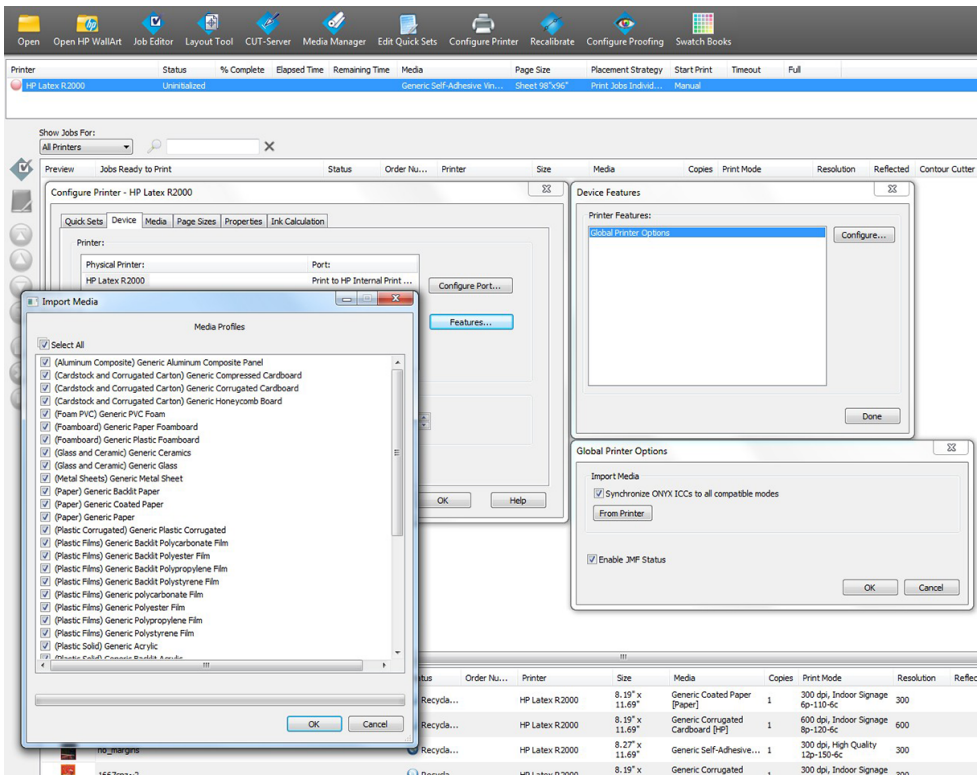
The following steps provide the complete procedure for this topic.

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

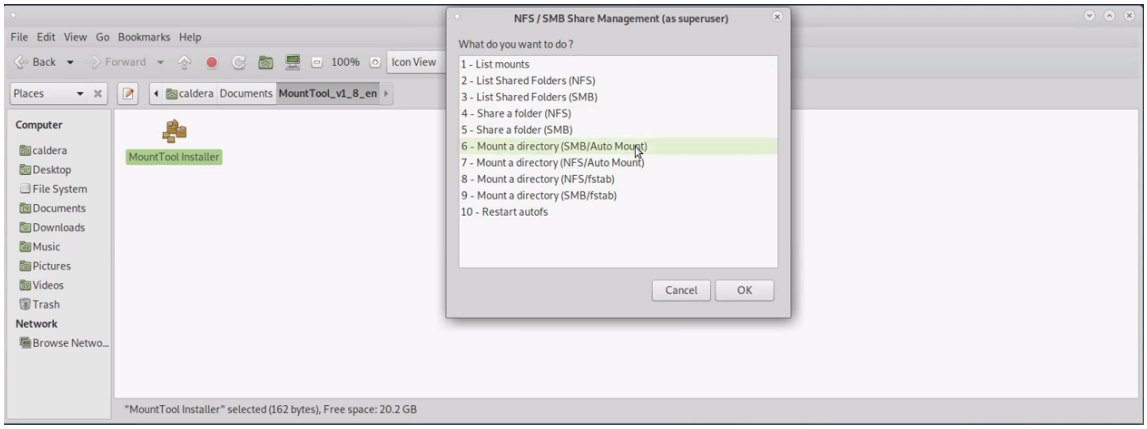
Follow the Caldera RIP and the printer driver installation instructions. After the RIP software has been installed and the printer has been added to the RIP, use the following procedures to configure the driver.

Mount the Internal Print Server hot folder

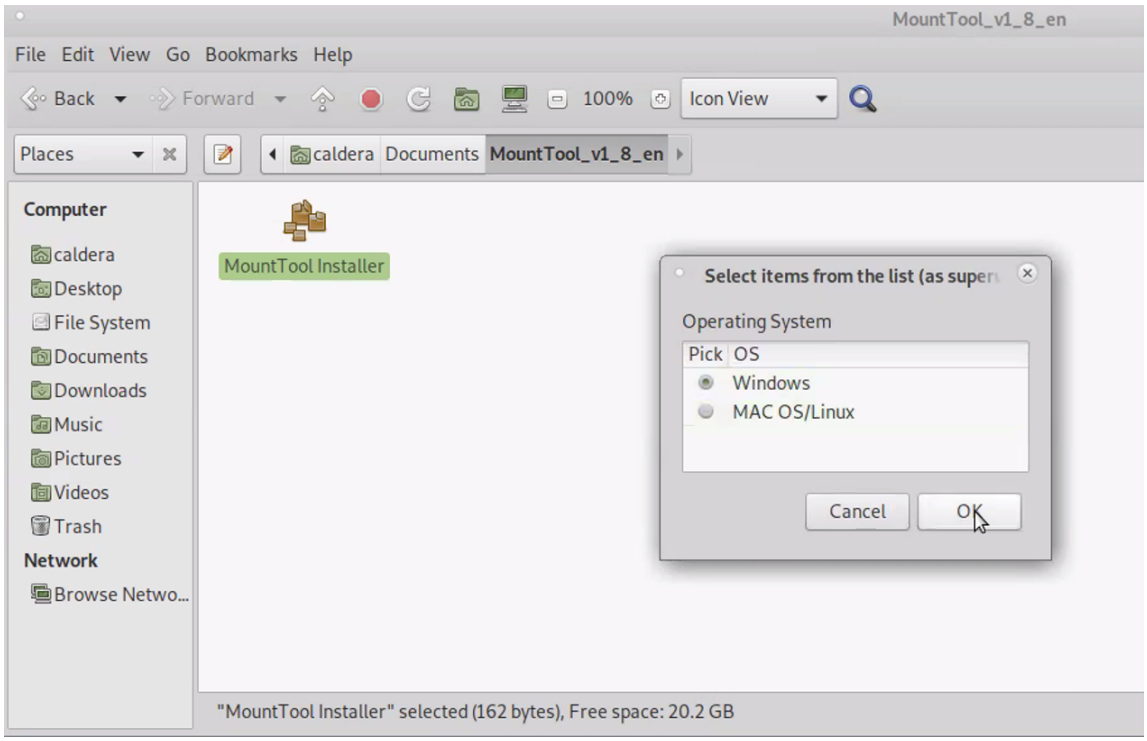
Follow these steps to install the Mount Tool 1.8.

For additional details, check the Caldera website at https://workspace.caldera.com/.

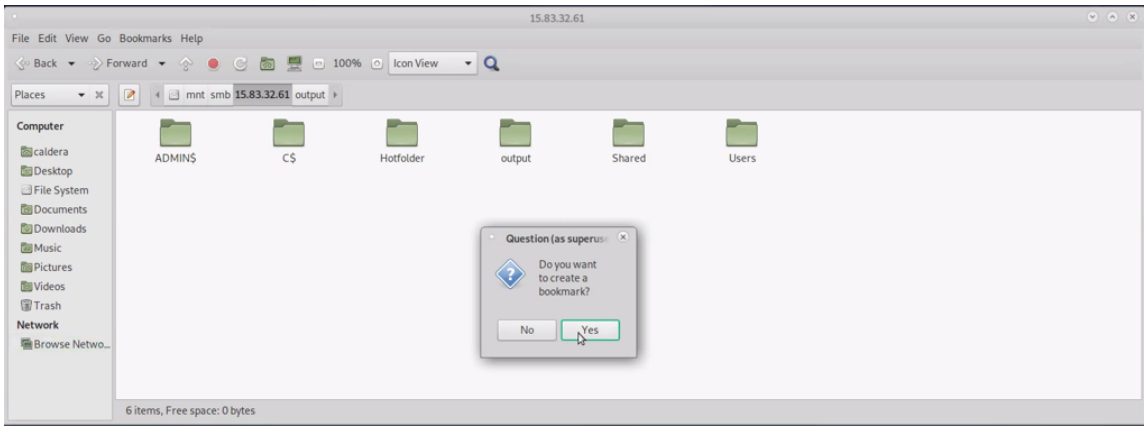
1. Select **Mount a directory (SMB/Auto Mount)**.



2. Select your operating system.



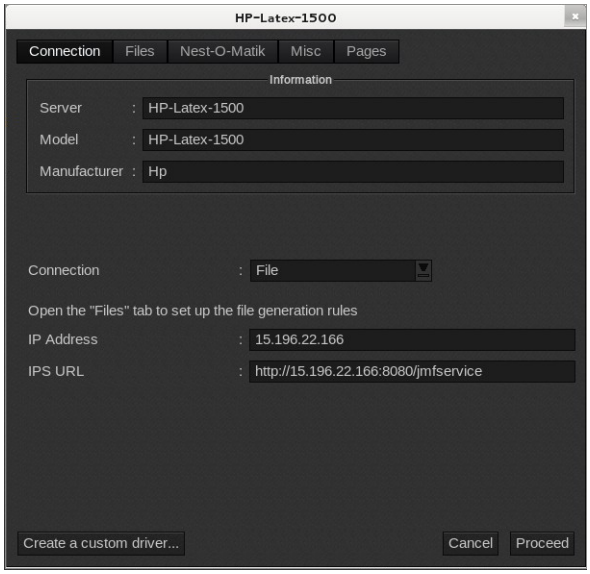
3. Click **Yes** to create a bookmark.



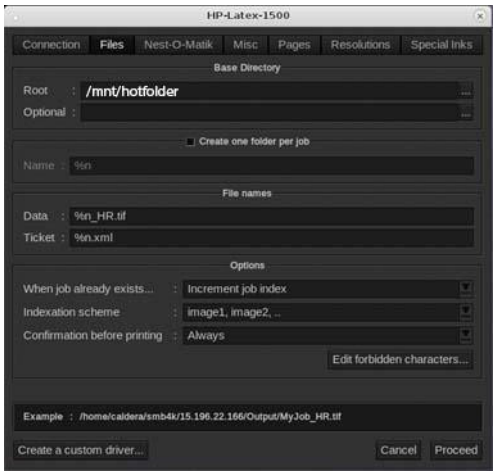
Configure the server administration

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

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.



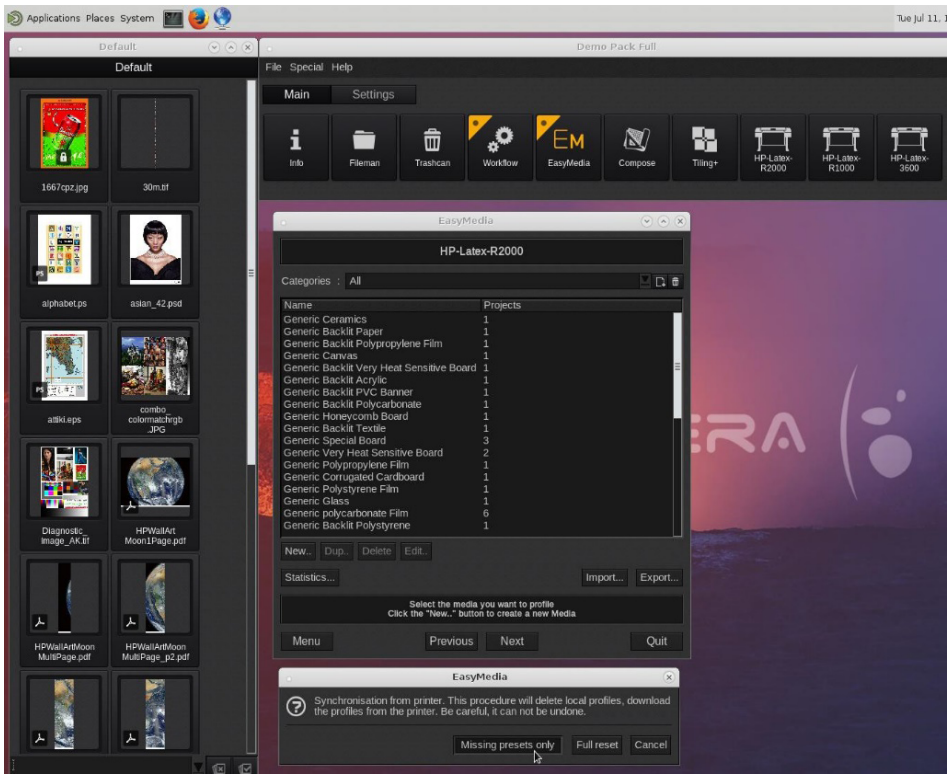
2. Set the path to your hot folder. Click the **...** button and select your mounted hot folder.



Synchronize substrates

The following steps provide the complete procedure for this topic.

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



5 Printing workflows integration

The following sections provide details for this topic.

Introduction to 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 various vertical print markets.

JDF implementation is typically based on an MIS system to be used 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 on 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 know 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 provides 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 website, http://www.cip4.org/.

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 interface 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 printer information can be communicated 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 case, the printer sees the print as one job, and the MIS should query the RIP for the status of each individual job in the nest.

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

How to integrate the printer into the Caldera RIP

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

1. Make sure you have the latest driver available from the Caldera website.
2. Obtain the printer's JMF URL from the Internal Print Server, by tapping **Tools** > **Preferences** > **General**.
3. Enter the printer's JMF URL into the **IPS URL** field of the Caldera printer configuration dialog.

   If there are problems using the printer's hostname, switch to the printer's IP using the printer's system configuration tool. For more details, see the service manual or talk to your network administrator to solve hostname resolution.
4. Once configured, 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

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

1. Make sure you have the latest driver available from the Onyx download manager.
2. Obtain the printer's JMF URL from the Internal Print Server, by tapping **Tools** > **Preferences** > **General**.
3. Enter the printer's JMF URL into the **JMF connection URL** field of the Onyx **Configure Port** dialog.

   If there are problems using the printer's hostname, switch to the printer's IP using the printer's system configuration tool. For more details, see the service manual or talk to your network administrator to solve hostname resolution.
4. Once configured, you can display the printer and job status by opening the info window in the RIP queue.

Job submission methods

The printer supports two file submission methods, in addition to opening a file directly in the Internal Print Server.

In the Internal Print Server, tap **Tools** > **Preferences** > **General**, and select the submission method from the **Submit method** drop-down list.

- **Hot folder**: Select a shared folder on the computer's hard disk; the RIP copies the output job there, and the Internal Print Server automatically loads jobs into the queue.

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

- **JMF**: The RIP sends the location of the job via a JMF command; the Internal Print Server automatically looks for the files there, and loads them directly into the printer queue.
- **Not specify**: Load the file manually in the Internal Print Server by tapping **File** > **Open**.

You can remove a job from the Internal Print Server or printer 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

MIS or production control software applications can retrieve printer status and notifications, together with job status and job ink and substrate consumption, from the printer with the HP JDF/JMF interface. It is also possible to remove a job from the printer queue with the HP JDF/JMF interface.

Specific RIP/MIS implementations will require vendor-specific configurations.

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 grouped jobs' individual job status.

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

If you are using the Caldera 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. Please 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. Please contact Onyx for further information.

If you are using another RIP solution, please 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 specifically supported JDF Software Development Kit from the HP Solutions Portal: https://developers.hp.com/lfp-enroll/.

6 Handle the substrate

Various substrate types are compatible with your printer.

Supported substrate types

For specific substrate settings and profiles, visit the HP website.

See the Online substrate manager on page 80.

Self-adhesive vinyl

- Cast self-adhesive vinyl
- Calendered self-adhesive vinyl
- Perforated self-adhesive vinyl
- Transparent self-adhesive vinyl
- Reflective self-adhesive vinyl

PVC banner

- Frontlit banner
- Backlit banner
- Scrim banner
- Scrimless banner
- Mesh banner with liner
- Blockout banner

Paper

- Coated paper
- Uncoated paper
- Photo paper
- Blue-back paper
- Self-adhesive paper

PP and PE film and banner

- Polypropylene (PP) film

- Synthetic paper (such as Yupo)
- Tyvek
- Coated PE/HDPE (polyethylene) banner

PET film

- Polyester (PET) backlit film
- Polyester (PET) frontlit film
- Polyester (PET) grey-back film

Textile

To check the porosity of your substrate, see Check the porosity of your substrate on page 46.

- Polyester textile and fabric
- Textile banner
- Backdrops
- Textile mesh with liner
- Frontlit textile with liner if porous
- Canvas
- Flag and voile with liner
- Cotton textile
- Self-adhesive textile

Wall covering

NOTE: This is an application example, not a selectable category.

- Paper wall covering or wallpaper
- PVC wall covering
- Pre-pasted wall covering
- Non-woven wall covering
- Textile wall covering
- Self-adhesive wall covering

Check the porosity of your substrate

The following steps provide the complete procedure for this topic.

1. If the printer has any substrate loaded, unload it.
2. Cut a piece of self-adhesive vinyl white gloss 15 × 50 mm (0.6 × 2 in) in size.

3. Stick it to the platen, covering the substrate-advance sensor.
4. Load the substrate that you want to check.
5. Open your RIP software.
6. Obtain the test file from the printer's built-in computer: **C:\Users\hplatex\Documents\HP IPS\InkTrespassingCheck\Ink_trespassing_check.pdf**.
7. Print the test file using the number of passes and substrate preset that you intend to use in future with this substrate (or a similar profile in terms of ink limit).
8. Unload the substrate.
9. Remove the strip of self-adhesive vinyl from the platen.
10. Look at the self-adhesive vinyl you have taken from the platen.

    If the strip is completely white (has no ink on it), the tested substrate is non-porous and may be used for printing as described in this guide.
11. Clean the platen, see Clean the output platen on page 184.

Supported HP substrates

For specific substrate settings and profiles, visit the HP Media Locator from PrintOS https://www.printos.com/ml/#/medialocator.

For the most up-to-date list of HP substrates compatible with your HP large-format printer, please visit the https://HPLFMedia.com/en/sign-display website.

Substrate notes

- HP Large Format Printing Materials Sustainability Highlights. See HPLFMedia.com/en/sustainabilityhighlights.
- 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 Gold Certified *. See http://www.greenguard.org/.

  * HP PVC-Free Wall Paper printed with HP Latex Inks is UL GREENGUARD Gold Certified. UL GREENGUARD Gold Certification to UL 2818 demonstrates that products are certified to UL's GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg or 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 www.umweltbundesamt.de/agbb_evaluation_scheme.

Substrate tips

Handle unprinted and printed substrates with care, and preferably with cotton gloves, to avoid fingerprints.

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

For heavy rolls, use a forklift, and two people wearing security shoes.

Before loading a roll:

- Check that temperature and humidity in the room are within the recommended ranges for the printer. See Environmental specifications on page 343.
- Check that neither the roll nor its core are bent or deformed, which may cause the substrate to jam in the printer.
- If the roll 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, by reading the label inside the core or the note inserted into the package.
- Check that the substrate is correctly attached to the input core. Otherwise, the Internal Print Server will report an error.
- Check the substrate thickness.
  - Up to 0.4 mm (0.016 in): Print normally.
  - 0.4 to 2 mm (0.016 to 0.079 in): Raise the carriage beam to a custom position. Edge holders are not needed and should not be used.
  - More than 2 mm (0.079 in): Not supported.

While loading a roll, ensure that the leading edge is parallel and straight across the output core, and attached evenly (start taping the substrate to the core at the center, then move towards the edges).

Also ensure that the side edges of the input and output roll are properly aligned. An incorrectly loaded roll may cause waves or cockles in the substrate, leading to ink smearing and printhead crashes.

After you have loaded a roll:

- If you intend to use substrate edge holders, do not use edge holders from another printer, use only the edge holders that came with your 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 91.
- 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 136.

- Do not cut off pieces of substrate while the substrate is loaded into the printer. This may cause the remaining substrate to jam.

You can find further information on the Web:

- HP Large Format Printing Materials Support Hub with technical date sheet with training videos, compatibility charts and additional resources from https://support.hplfmedia.com/docs/getting-started.
- Warranty information for each individual HP substrate are available from https://HPLFMedia.com/en/mediawarranties.
- HP Image from https://HPLFMedia.com/en/printpermanence/.

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:

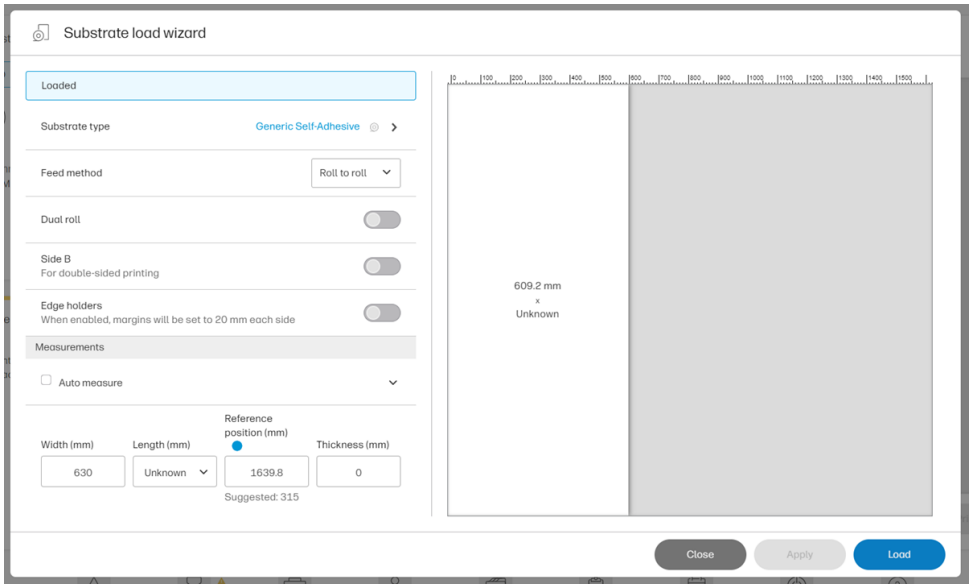
- If a large job is being printed in panels, more than one roll may be required. All rolls should be from the same batch, and stored under correct conditions according to the manufacturer's specifications.
- Operating conditions (temperature and humidity) should be kept constant during the printing of 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 142 and Consistency mode (optimize for tiling) on page 69.

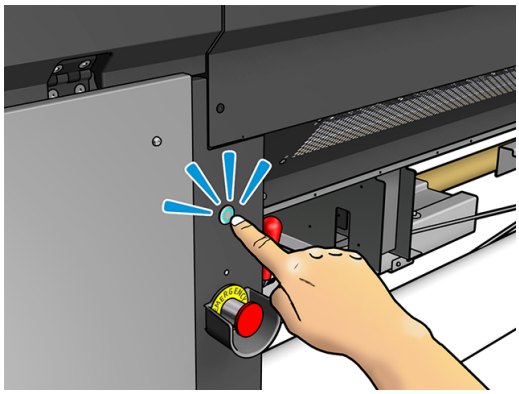
Substrate configurations

The substrate can be loaded in a variety of different configurations to suit your different needs.

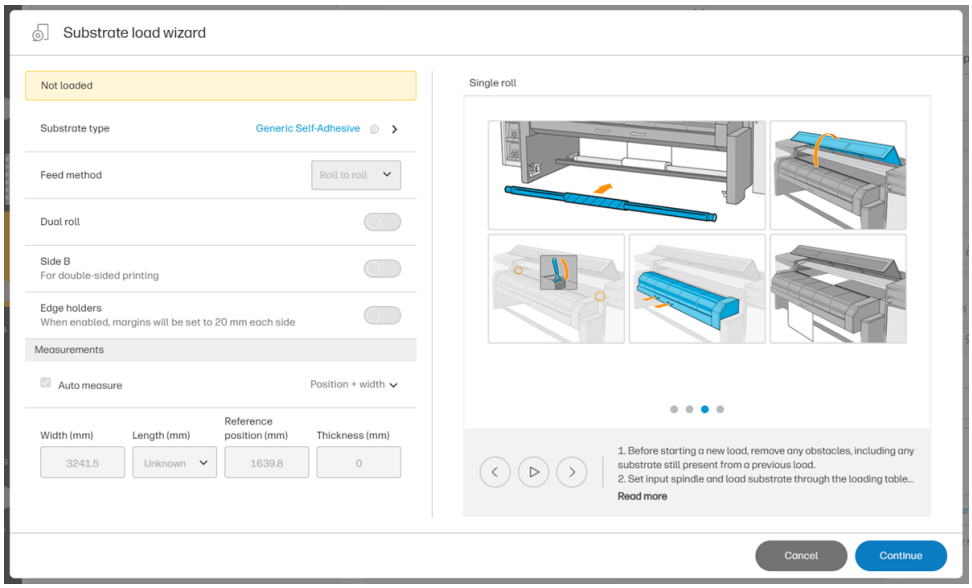
Before loading, you must go to the Internal Print Server and select **Substrate load/unload**, then select the configuration you intend to use.



You can also start to load the substrate and start the load process by pressing the corresponding button at the input side of the printer.

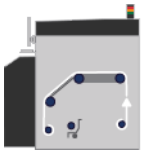


The physical button is permitted when its light is on.



The basic printer configuration is roll-to-roll, and can be used for single-roll or dual-roll printing.

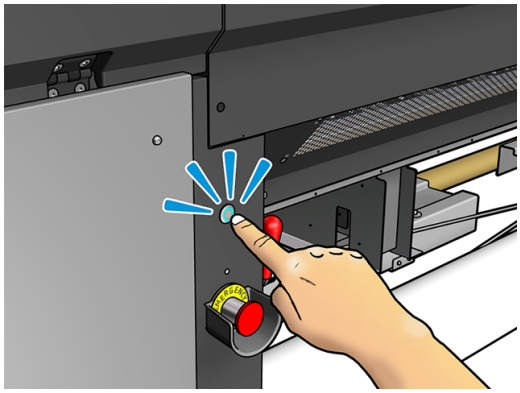
- **The roll-to-roll configuration** is suitable when you do not intend to cut and take away some prints or the output roll in the middle of a print job being done using a particular input roll. The substrate cannot be cut in mid-roll, except during double-sided printing, and then it must be reloaded afterwards.



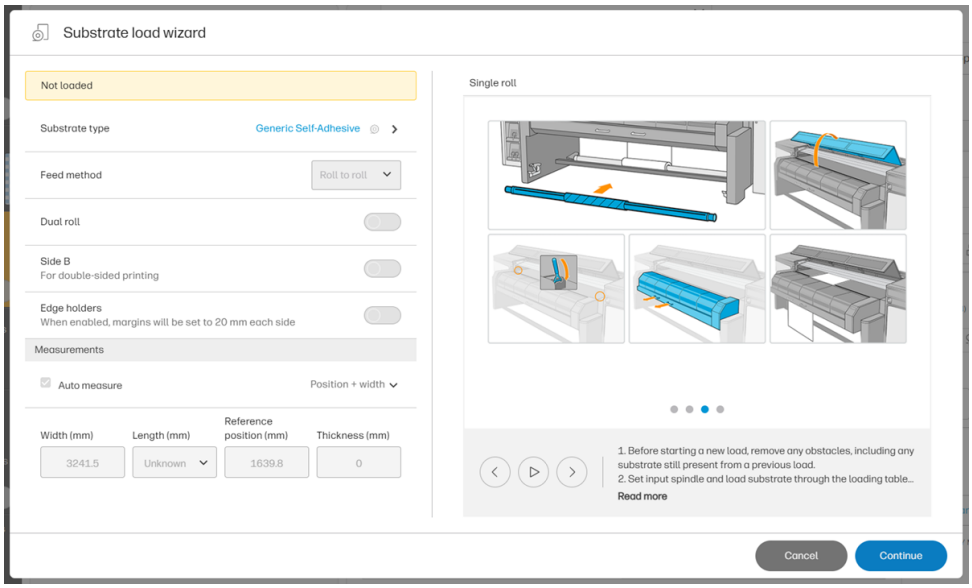
Prepare to print

The printer must be correctly configured and the substrate loaded before you can start to print.

1. Go to the Internal Print Server and select **Substrate Load/Unload** to open the Printer Configuration window or start the loading process by pressing the physical button.



2. Select the printer configuration that you intend to use; the on-screen help will appear on the left.



NOTICE: The **Reload substrate check** box should be checked only if the printer has just previously had the same configuration (the same substrate and same profile), and because of a severe system error, you had to restart the printer.

3. Load the substrate. Substrate loading instructions are displayed in the Internal Print Server window. For more detailed instructions, see Load a roll onto the spindle on page 54 and Load a roll into the printer on page 56.
4. Select the substrate type.
5. Tap the **Finish** button in the Internal Print Server to start the substrate check, then enter the substrate type in the Loaded Substrate window.

TIP: If the printer has been idle overnight with substrate loaded, and exposed to high or low temperatures, advance the substrate about 25 cm (10 in) before printing, to avoid printhead crashes or ink smears on the substrate.

Substrate edge holders

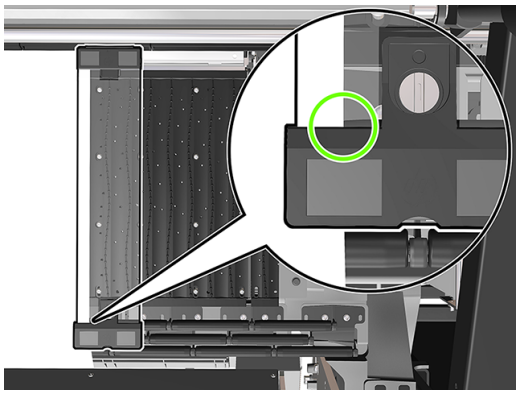
The purpose of the substrate edge holders is to prevent the substrate edges from lifting up and jamming while printing. If you experience this kind of problem while printing, you can try using the edge holders to overcome it.

The edge holders are highly recommended when printing on textile substrates.

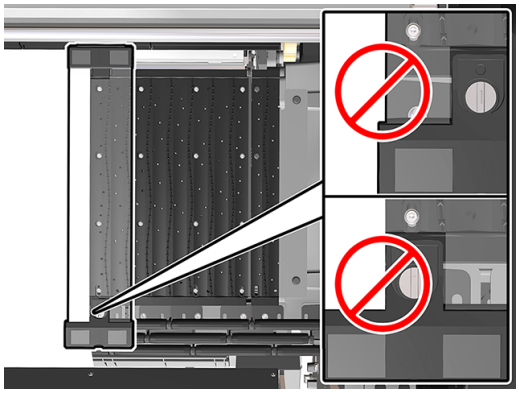
NOTE: The edge holders are not recommended when printing on substrate that is more than 0.4 mm (0.016 in) thick.

TIP: The edge holders may be easier to deploy if you raise the carriage beam (see Set the carriage beam position on page 91); however, they can be deployed without raising the carriage beam.

The correct position is illustrated below. The substrate should be free to move, and should not touch the ends of the edge holder.



CAUTION: Wrongly positioned edge holders could severely damage the printheads and carriage.

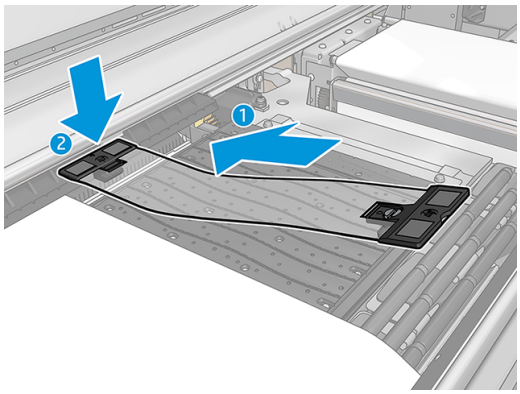


NOTE: If the substrate is loaded with the right edge outside the 161 cm position on the spindle ruler, or the left edge outside the –162 cm position, the edge holders cannot be used because there is not enough space for them.

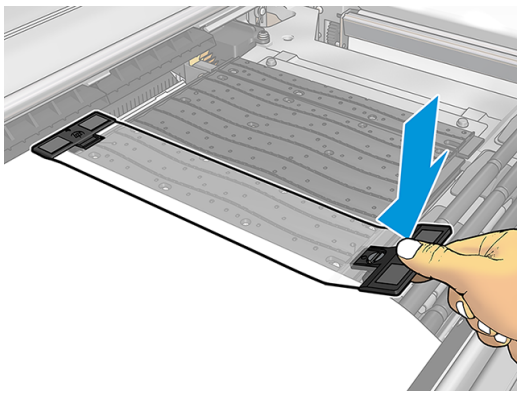
Install an edge holder

The following steps provide the complete procedure for this topic.

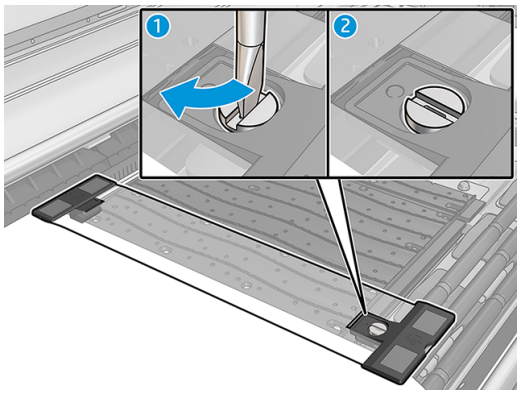
1. Standing in front of the printer, place the edge holder onto the far side of the platen and cover the edge of the substrate with it.



2. Attach other side of the edge holder in the space of the top diverter profile, covering the edge of the substrate with it. Make sure that each edge holder is properly positioned and not bent as this could cause a carriage crash.



3. Turn the screw at the front part of the edge holder to fix it in place.



4. Ensure that the substrate is aligned with the edge holder.

⚠ CAUTION: Place the edge holder carefully. It should remain perfectly straight, otherwise it could damage the printheads and carriage.

TIP: Once installed, an edge holder should not be slid sideways. If you want to move it sideways, remove it and reinstall it in the new position.

Replace an edge holder strip

Replacement edge holder strips can be found in the user maintenance kit.

Replace the strip if it is broken (for example, by an impact) or deteriorated (for example, by accumulated ink).

1. If it is installed in the printer, remove the edge holder from the platen.
2. Remove the old strip and insert the new one.
3. Replace the edge holder on the platen, if you intend to use it.

Load a roll onto the spindle

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

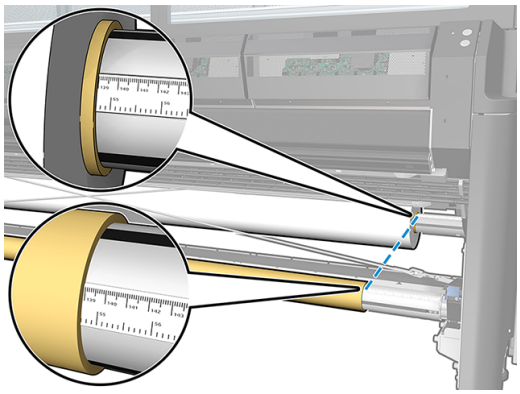
Single-roll printing

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.

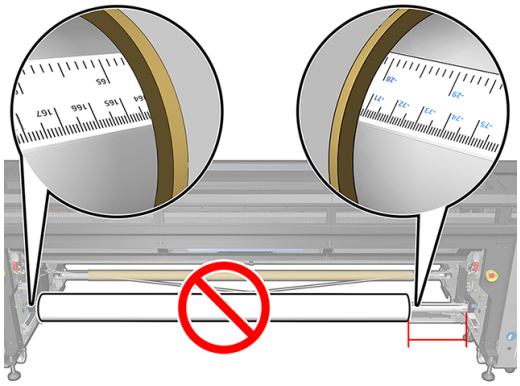
TIP: The spindle is quite heavy in order to ensure stiffness and so avoid skew and wrinkles, so two people are recommended for this operation.

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.

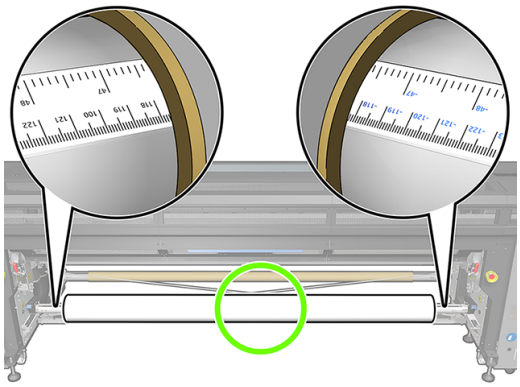


TIP: The rolls should be centered to reduce the risk of skew, wrinkles, and telescoping.

a. Off-centered:



b. Centered:



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.

There are different ways in which the substrate can pass through the printer:

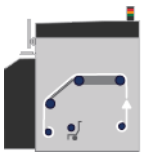
- Roll-to-roll configuration
- Dual roll-to-roll configuration

Load a roll (roll-to-roll configuration)

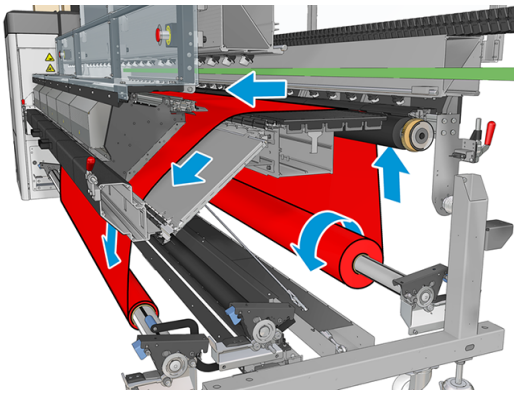
The substrate roll is mounted on the input spindle (single or dual) and will be collected on the output spindle.

https://lkc.hp.com/printers/hp-latex-3000/blog/how-to-load-a-substrate-on-a-roll-to-roll-configuration

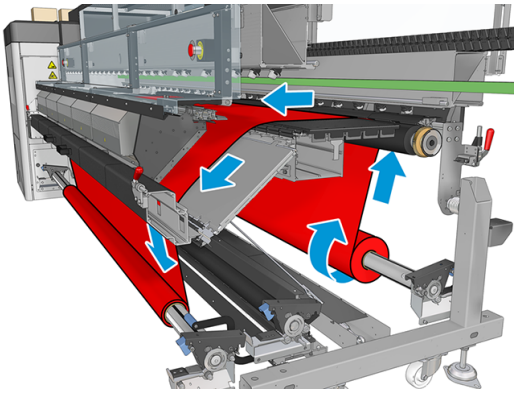
NOTE: This video applies to HP Latex 800, HP Latex 1500, HP Latex FS50/FS60 series, and HP Latex 3x00 series printers.



The substrate goes from the input spindle (1) over the main roller (2), over the platen (3), over the front diverters (4) and then to the output spindle (5).



The above illustration shows the substrate loaded with the printed face outwards on both input and output rolls. You can also load substrate with the printed face inwards on either or both rolls, in which case the spindle will turn in the opposite direction. The printer asks you for the winding direction if it cannot detect it automatically.



Each of the spindles has its own motor. The motors maintain tension on the substrate. Some vacuum is applied at the level of the platen to keep the substrate flat. The substrate is moved forwards by the drive roller motor, on which there is a pinch mechanism to prevent the substrate from slipping.

Before loading a roll into the printer, you must have a roll loaded onto a spindle (the input roll) and an empty core loaded onto another spindle (the output roll). See Load a roll onto the spindle on page 54.

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.

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.

Roll-to-roll configuration

Configure the printer and load the substrate.

1. Go to the Internal Print Server and select **Substrate Load/Unload**, then select the correct configuration.
2. In the Internal Print Server, choose from the list of substrate types the type that you have loaded.

3. If they are installed, remove the substrate edge holders from the print platen so that they do not get in the way while loading the substrate.

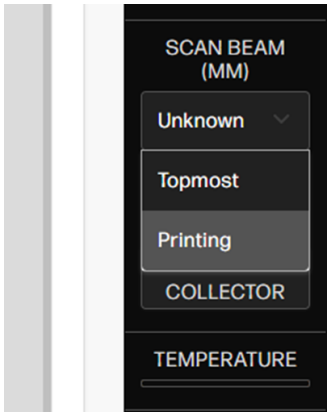
⚠ **CAUTION:** Loading the substrate on top of the edge holders could severely damage the printheads and carriage.

4. Bring the new roll on its spindle to the rear of the printer, with the geared end of the spindle on the left.
5. Rest the ends of the spindle on the platforms provided at the rear of the printer; plastic pads are provided to absorb the impacts.
6. In the same way, load the spindle with the empty core into the front of the printer. In this case, the geared end of the spindle should be on the right.

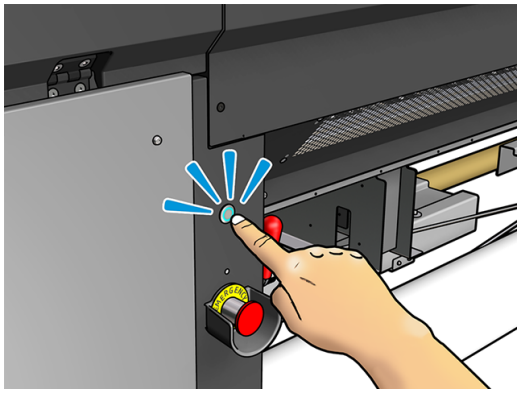
Loading substrate

Detailed instructions for the loading process.

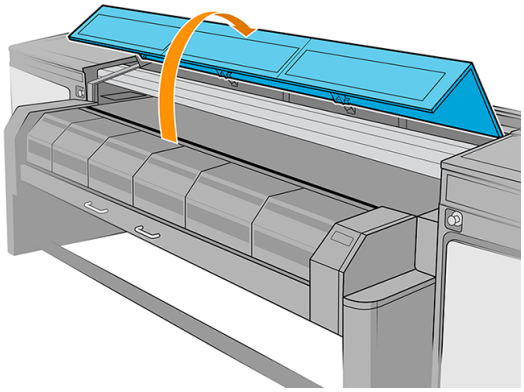
1. Use the Internal Print Server to raise the carriage beam to its loading position.



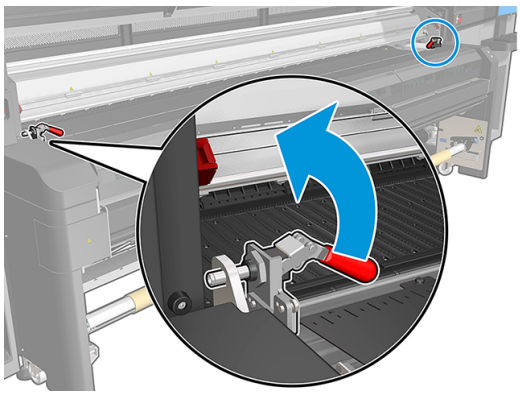
or start the loading process using the substrate button.

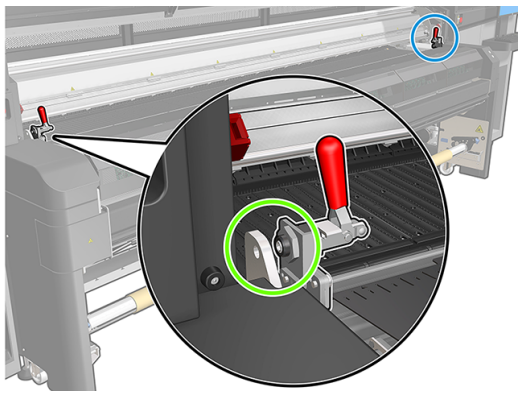


2. Open the window.

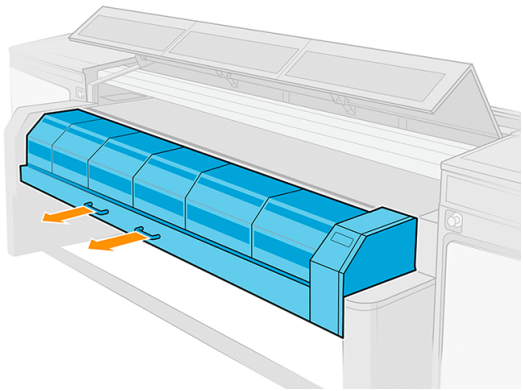


3. Open the curing module latches.

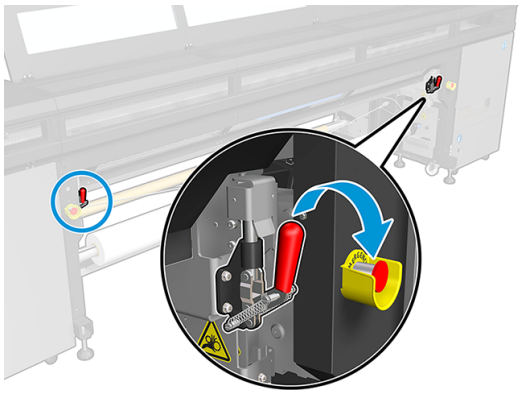


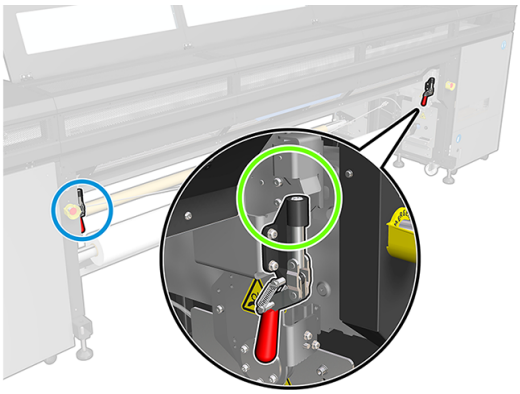


4. Open the curing module.

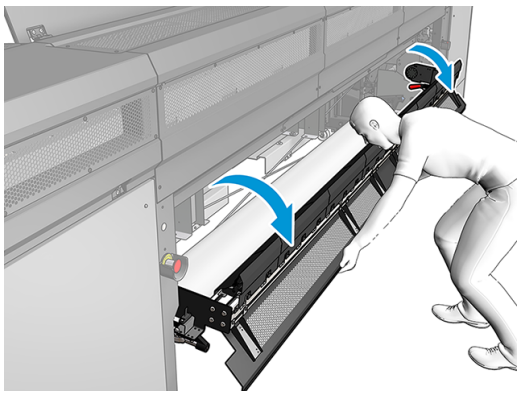


5. Open the loading table latches.

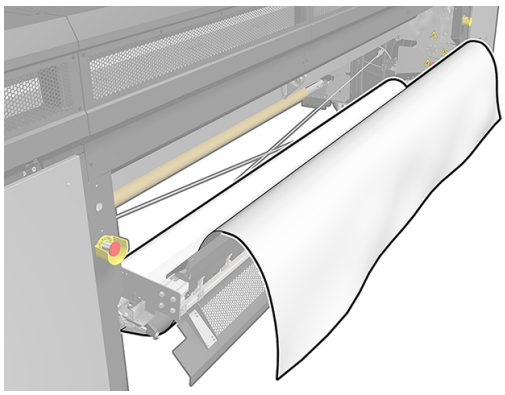




6. Open the loading table.

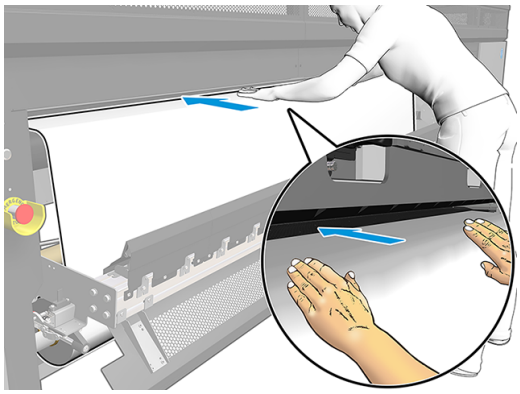


7. Unwind a length of substrate.

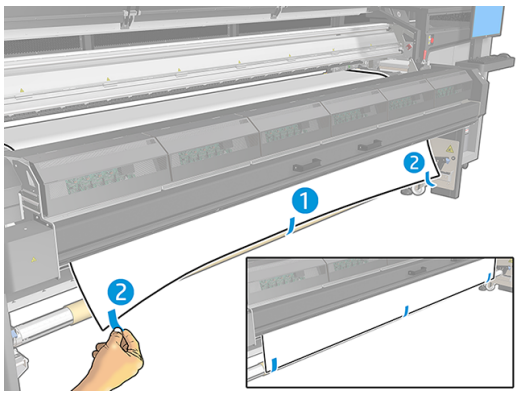


8. If the heavy-duty roll accessory is installed, make sure the substrate is loaded behind the input diverter roller.

9. Place it in the print zone.



10. Push the substrate through the printer until it reaches the output spindle.
11. If the substrate saver is required, install it now. See Substrate saver on page 157.
12. Align the substrate by checking that the substrate edge is in the same position on the input and output spindles. This can be done by using the rulers on the spindles or by measuring the distance between the right edge and the side plate.
13. 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.



14. Close the window and the curing module.
15. Close the loading table.
16. If you are using the substrate edge holders, place them on the platen before closing the window.
17. Use the Internal Print Server to lower the carriage beam to its printing position.
18. Go to the Internal Print Server and tap the **Feed** button. The printer rotates both rolls to check their diameters, and it also checks the width of the roll, the winding direction, the vacuum, and the substrate advance calibration (this takes about a minute).

NOTE: Some substrates (such as transparent 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.

19. An alert about substrate-advance tracking may appear at this point. For more information on when you might want to turn off automatic tracking, see Substrate-advance compensation on page 145.

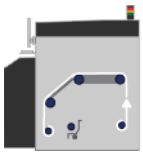
The printer is now ready to print.

Load a roll (dual roll-to-roll configuration)

The two substrate rolls are mounted on the rear dual-roll spindle and will be collected on the front dual-roll spindle.

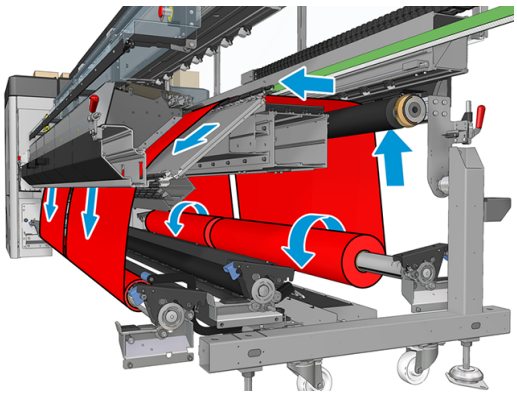
http://www.hp.com/go/Latex3000/Dual_roll_loading

NOTE: This video applies to HP Latex 800, HP Latex 1500, HP Latex FS50/FS60 series, and HP Latex 3x00 series printers.

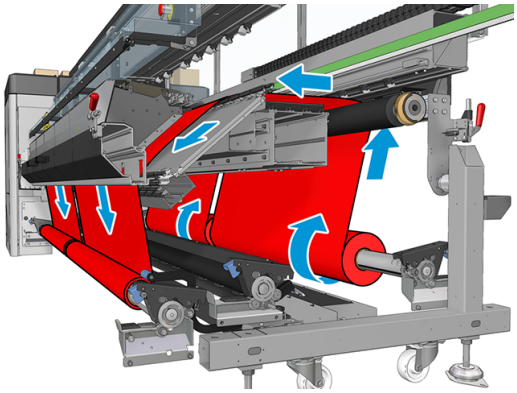


The substrate goes from the input spindle over the main roller, over the platen, over the front diverters and then to the output spindle.

NOTE: When using dual rolls, you have to use the roll-to-roll configuration as it is the only configuration supported.

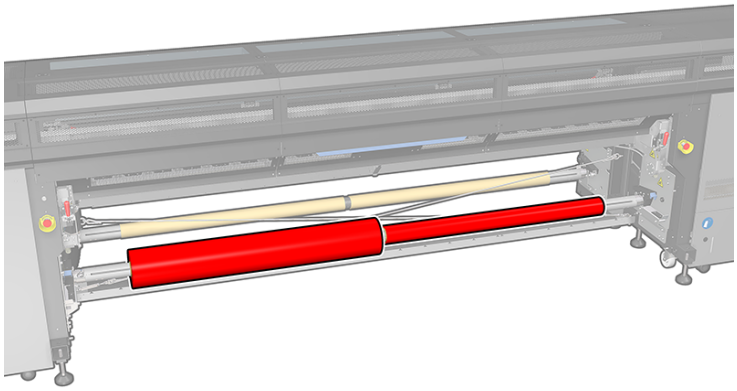


You can load substrate with the printed face inwards or outwards on the spindle, in which case the spindle will turn in the opposite direction. The printer asks you for the winding direction if it cannot detect it automatically.



Before loading two rolls into the printer, you must have both rolls loaded on the rear dual-roll spindle and two empty cores loaded on the front dual-roll spindle. See Load a roll onto the spindle on page 54.

For best print quality, try to use two rolls of the same diameter. If the rolls are of unequal lengths, the longer roll should be on the right as seen from the front of the printer; on the left as seen from the rear. That way, when the shorter rolls runs out, you can continue printing on the other roll.



When one roll runs out, lock the differential in the middle of the spindle, using the lever on the left-hand side.

Dual roll-to-roll accessories

For the dual roll-to-roll accessories, see the separate user guide.

Double-sided printing

Selecting the double-sided printing option will provide you with guidance and help specific to double-sided printing during the loading process.

https://lkc.hp.com/blog/how-print-double-sided-storyboard-hp-latex-2700-printer-series

Blockout (opaque substrate)

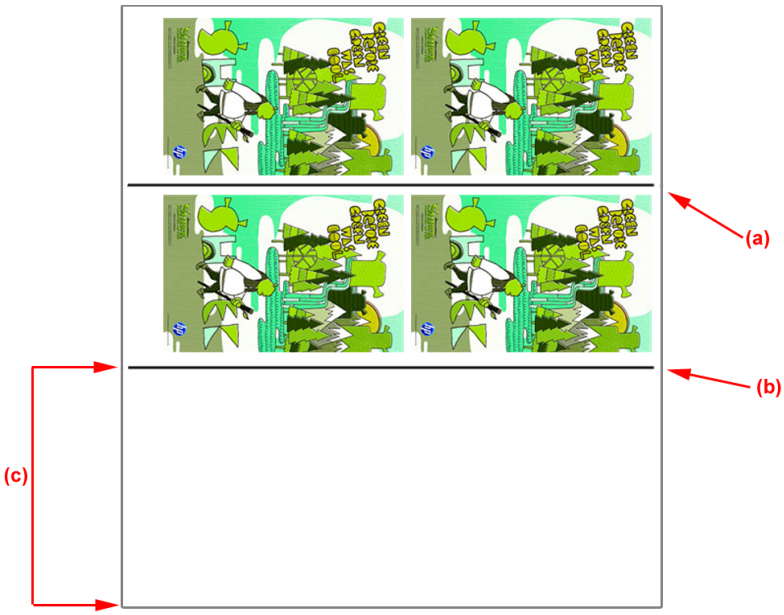
The roll-to-roll configuration is recommended for double-sided printing. You can use the dual-roll spindle to print the side A of multiple jobs. But side B must be printed in single-roll. Side B of jobs must be printed as two separate queues.

Double-sided jobs must be defined as pairs of images. Open Job Properties for each job to specify each image.

- Side A is the first image to be printed.
- Side B is the second image to be printed, on the reverse of Side A.

On Side A, after each row of images a black continuous line called a “registration line” is automatically printed: (a) and (b) below. These registration lines are used while printing Side B to minimize any registration errors in the direction of substrate movement.

When the whole of Side A has been printed, a space (c) is left blank so that the substrate can be loaded for printing side B.



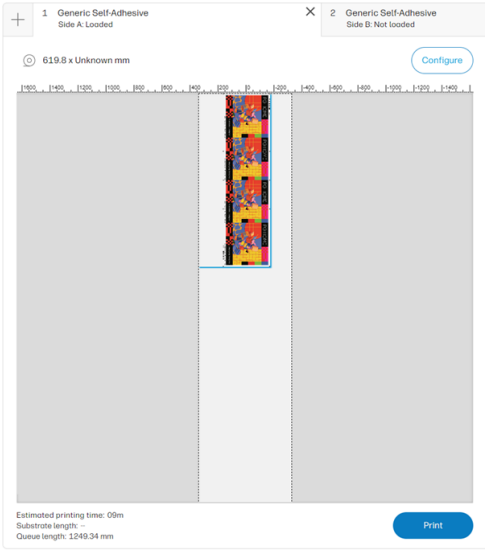
Side A: Load and print

The following steps provide the complete procedure for this topic.

1. Load the roll-to-roll configuration: see Load a roll (roll-to-roll configuration) on page 56.

NOTE: The dual-roll spindle can be used to print side A but not side B of double-sided jobs.

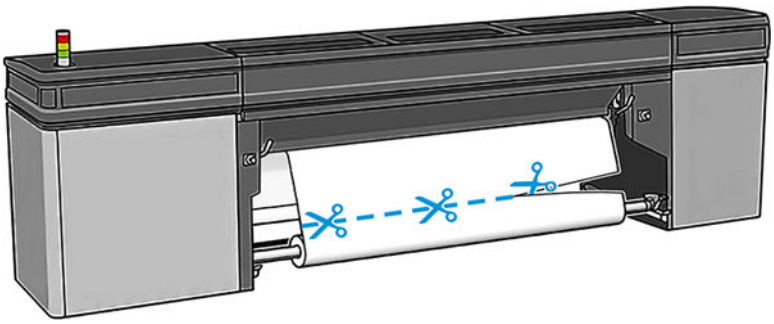
2. Select the side A queue in the queue preview, and tap the **Print** button to start printing.



Side A: Unload

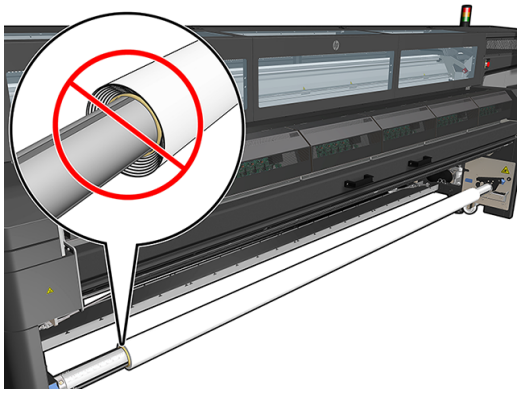
The following steps provide the complete procedure for this topic.

1. Cut the substrate close to the input roll.



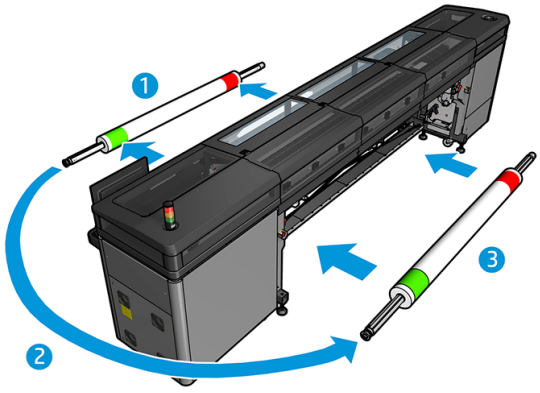
2. To help with the alignment, mark the registration line with a pen or pencil from side A to side B. This line will be used afterwards before printing side B. Do not make a mark by cutting with scissors, as this can cause the substrate to come into contact with the printheads.

3. Collect the substrate onto the output spindle. Check the substrate is collecting correctly on to the spindle to avoid telescoping.



4. Remove the input spindle.

5. Remove the output spindle (1), carry it around to the input side with the same orientation (2) and install it into the input position (3). **Maintain the same orientation:** Left edge always on the left, as indicated below with the colors blue and red.

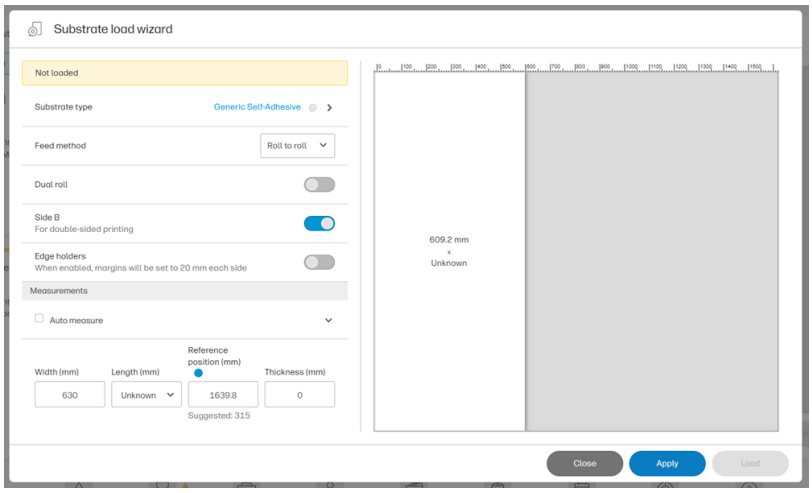


You are now ready to load the substrate for printing on side B.

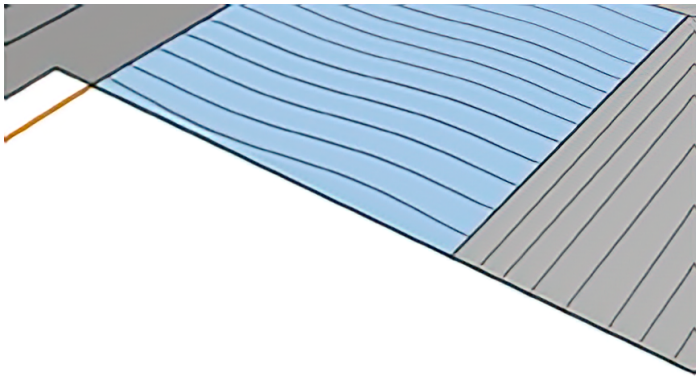
Side B: Load and print

The following steps provide the complete procedure for this topic.

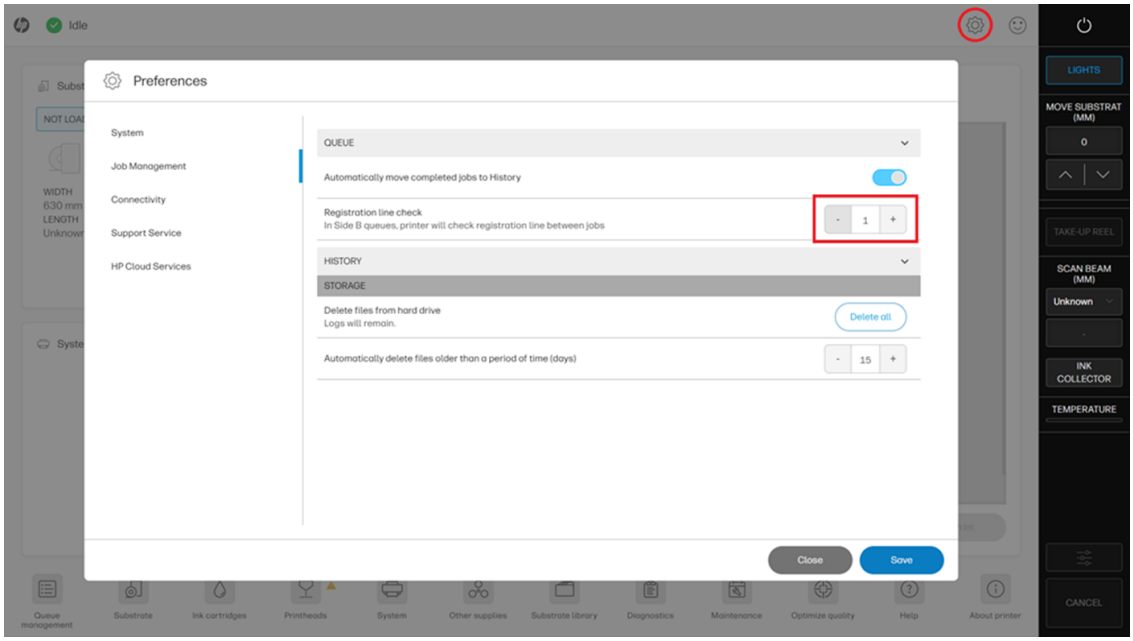
1. In the Substrate Load Wizard, select **Side B**, tap the **Load** button, and follow the instructions.



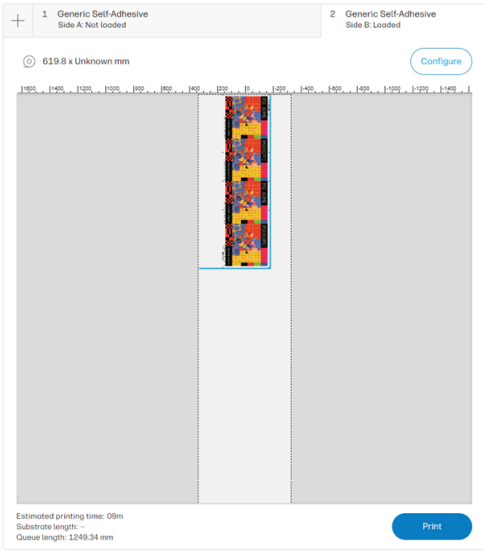
2. Align the registration line with the beginning of the platen (input side).



NOTE: By default, the printer reads and adjusts the registration on each line, but this setting can be modified to increase productivity (this option is available in **Preferences** > **Job management**). Bear in mind that registration accuracy will decrease if you significantly increase the space between the readings. HP recommends testing the optimal setting for each substrate, as expansion or stretching will have a big impact, together with the length of the jobs.



3. Finish the loading process, select the Side B queue, and tap the **Print** button.



NOTE: In Firmware versions MR3 and above, jobs can be rotated in the HP Internal Print Server application.

NOTE: Before tapping **Print**, ensure that the Side B queue is selected.

The printer will automatically detect the registration line and the Side B image will be positioned to minimize registration errors. This detection occurs automatically after each row detected and an adjustment is made accordingly.

4. Unload the roll.

Output-platen light

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

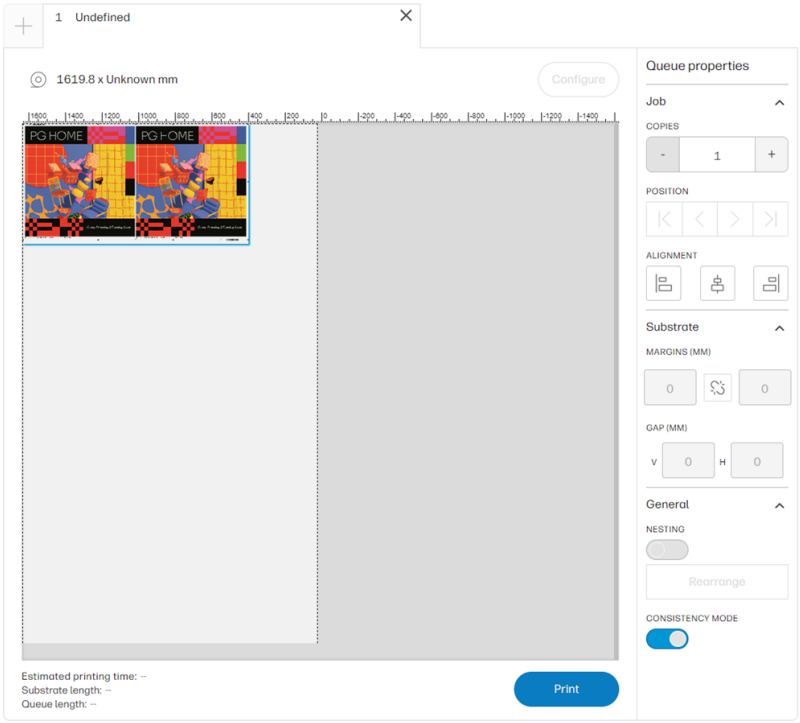
⚠ **CAUTION:** Be aware of a risk of burns.



Consistency mode (optimize for tiling)

This mode improves color consistency, specifically for tiling applications within a printer, within a single job, and within the same substrate roll.

To enable consistency mode, tap the CONSISTENCY MODE switch near the bottom of the Queue Properties bar in the Internal Print Server.



It reduces color variations during long printing to maximum color difference (95% of color) ≤ 1 dE 2000 in Tiling mode.

It is not a printer-to-printer color-consistency solution.

It does not modify existing print modes or substrate presets.

HP highly recommends adding an ink-dump plot nested in front of the job requiring color consistency. It will improve the color consistency of the first meter of the job. The ink-dump plot should use the same

print mode and resolution as the job; it should have the width of the substrate and a minimum length of 25 cm (10 in).

The ink-dump plot should be a CMYK = [100%, 100%, 100%, 100%] with no color management (ICC off). It will appear to be a black image. It forces all printheads to spit and warm up so that they can perform with color consistency for the incoming job.

Optimize for ink consumption

This topic explains the concepts involved in this subject.

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

Considerations

This topic explains the concepts involved in this subject.

- 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.

7 Create and manage print jobs

The following sections provide details for this topic.

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:

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

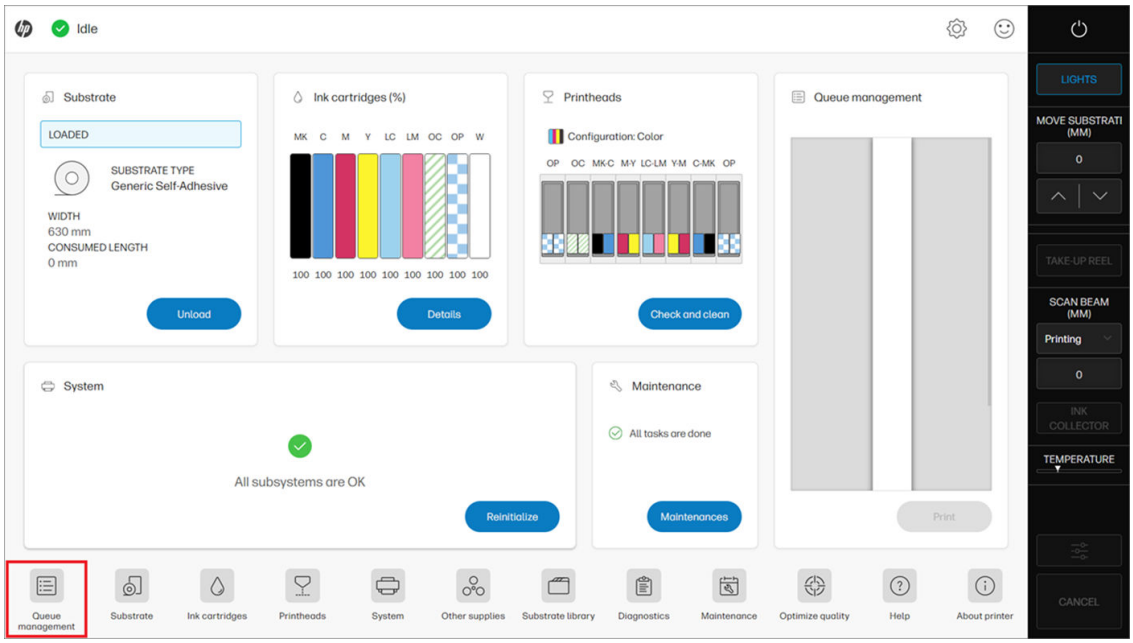
IMPORTANT: The output folder should be the shared folder on the Internal Print Server computer that was created during printer installation. The Internal Print Server cannot take files directly from the network because access would not be fast enough.

IMPORTANT: To make adding new jobs easier, HP recommends configuring the output folder of your RIP software to use the shared folder created during installation.

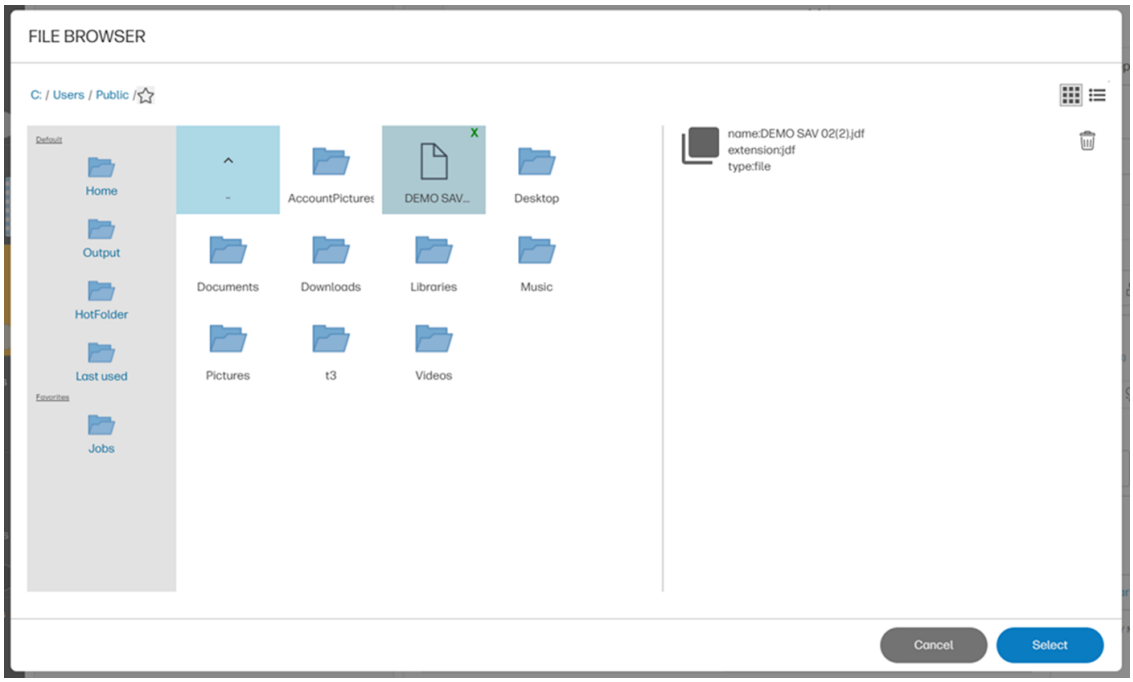
With this configuration, each job created by the RIP will be automatically added to the Internal Print Server's inbox.

Alternatively, if a shared folder cannot be used, the files generated by the RIP can be provided to the printer using a USB device. In this case, follow the instructions below:

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

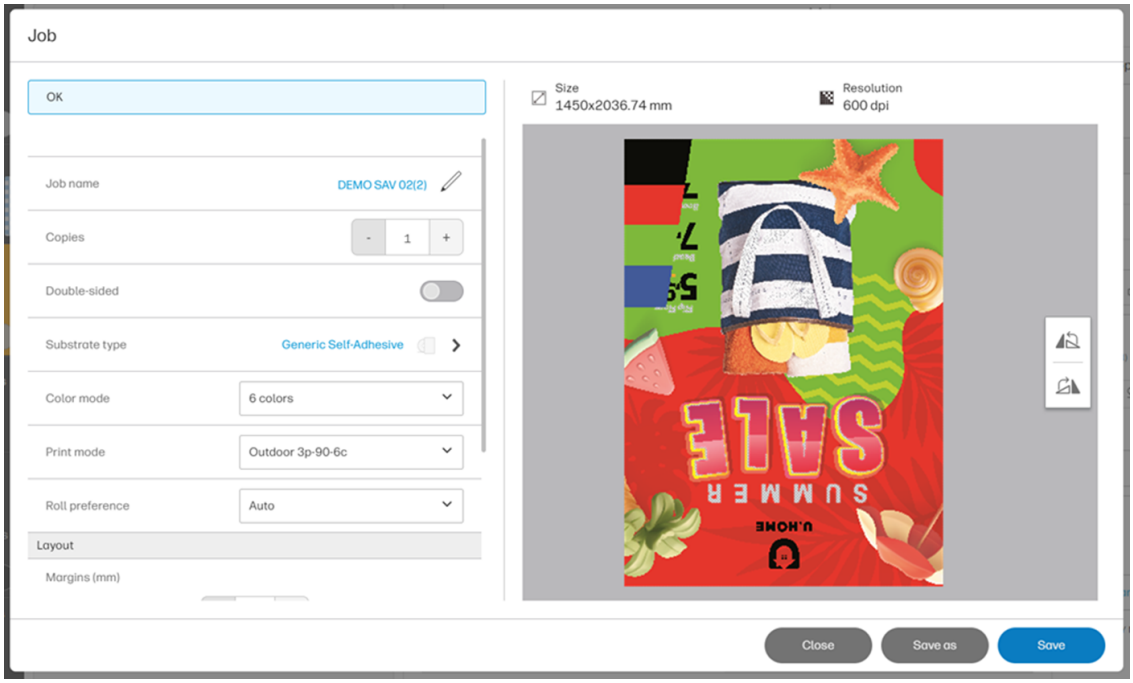


2. Tap the Add new job icon . Navigate to the folder on the USB device containing the print job files, and tap **Open** to import the job into the Internal Print Server.



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

   The next dialog box displays information about the job.



4. Tap **Save** if you accept the displayed properties.

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 74), 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 86. This is recommended for advanced users only.

Prepare the printer for a new substrate

Try to ensure that your printer is in a suitable state for creating a new preset.

1. 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. Choose a suitable carriage beam printing position: see Set the carriage beam position on page 91.

Add a substrate preset

To add a substrate preset, follow these steps.

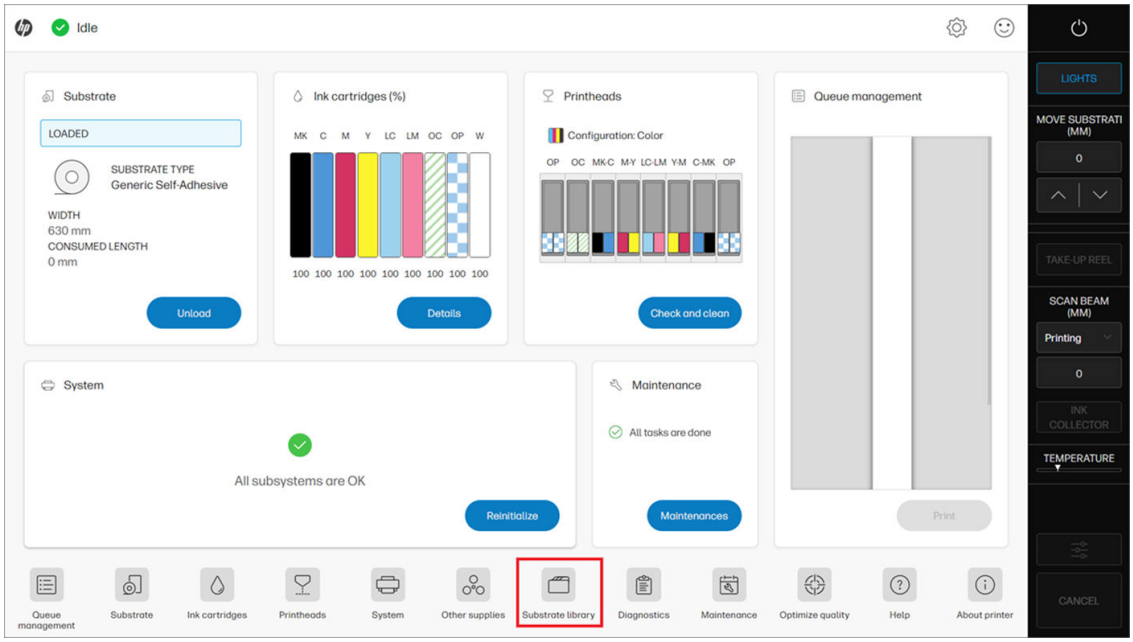
http://www.hp.com/go/latexRseries/add_new_media

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

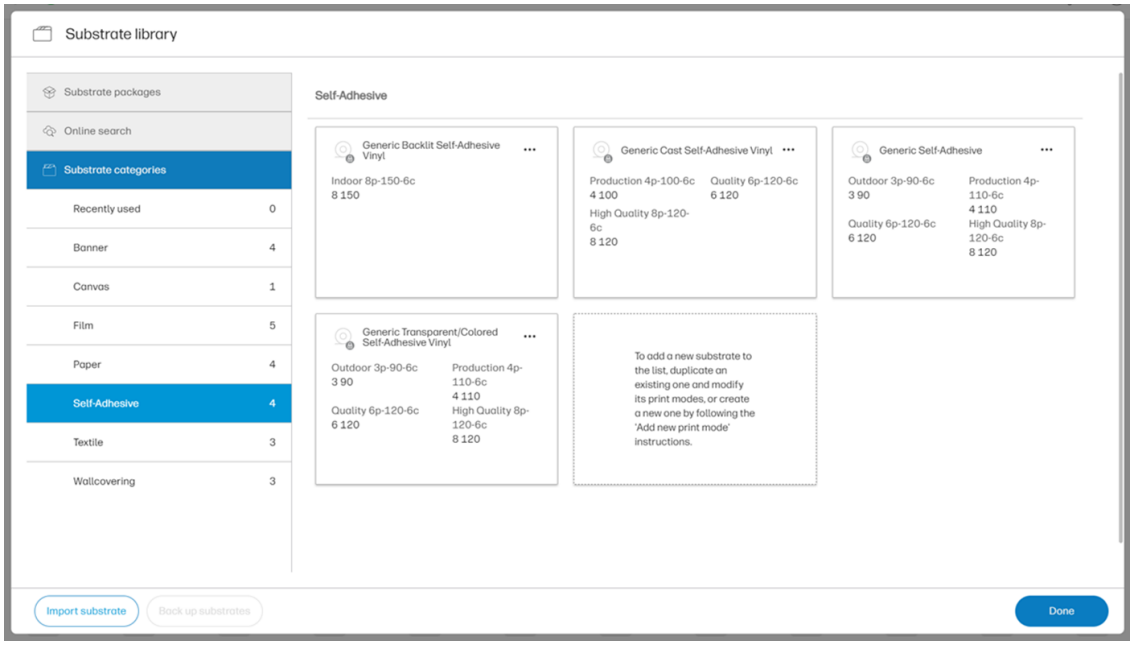
- To assign a name of your own choice to the preset.
- To adjust the preset to the precise characteristics of your substrate.
- To adjust the preset to your intended use of the substrate, which may range from highest-quality printing to fast production output.

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

1. Go to the Internal Print Server and tap the Substrate Library icon , among the icons at the bottom of the screen.



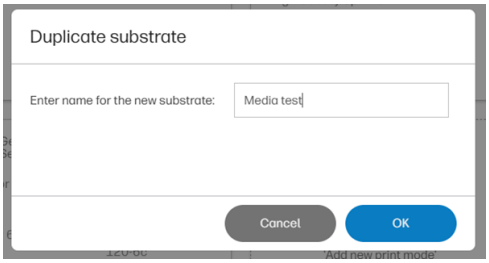
2. Select a preset from the Substrate Library.



3. Tap **Duplicate** to clone the preset.



4. Enter a name for the new preset.



A new preset is created, which you can see in the substrate library.

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

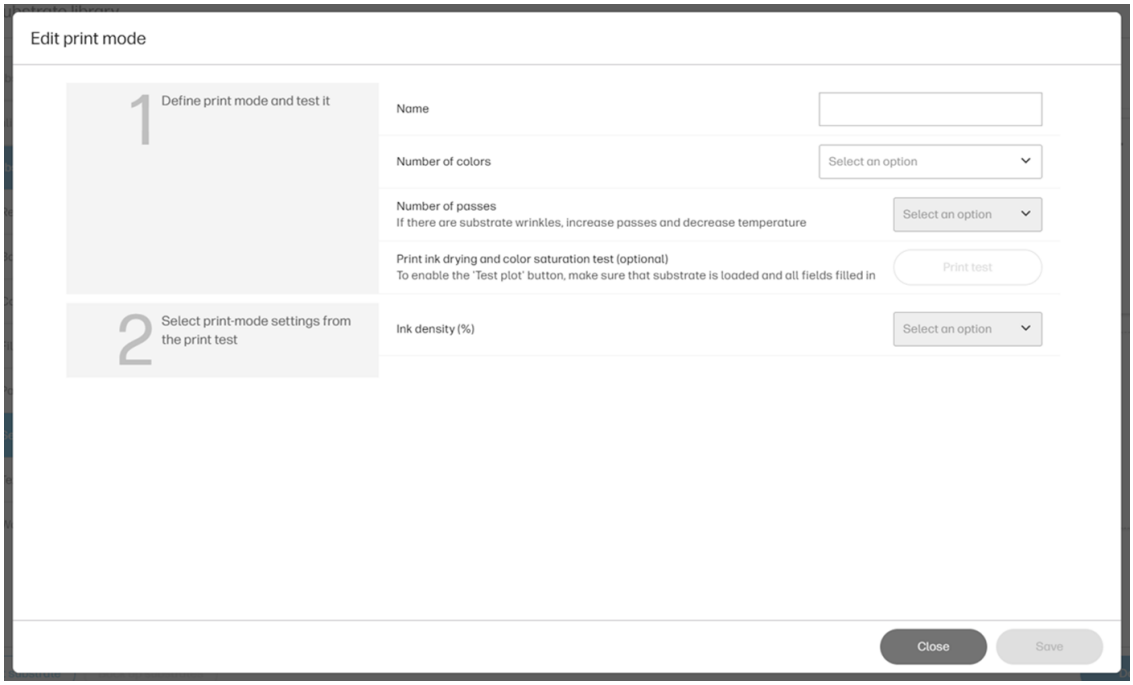
6. Tap the Pencil icon icon of the print mode that you want to modify; or tap **Add new print mode**.

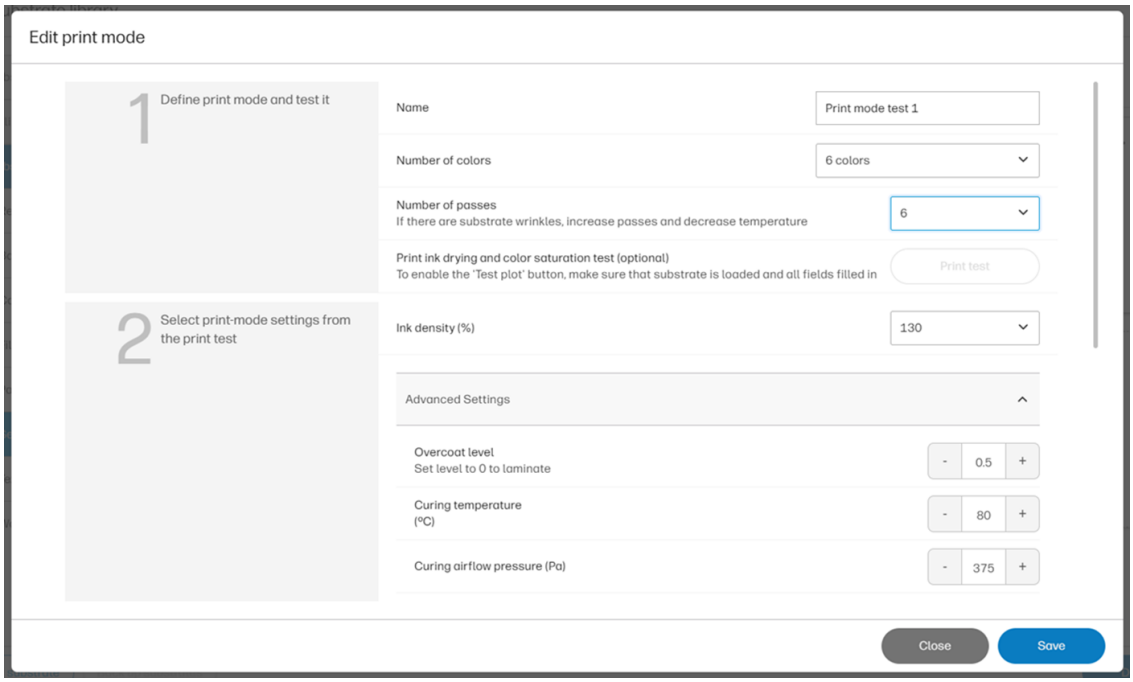
   You can delete or change the name of any print mode; although you should keep at least one print mode.

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.





8. Define a print mode and test it.

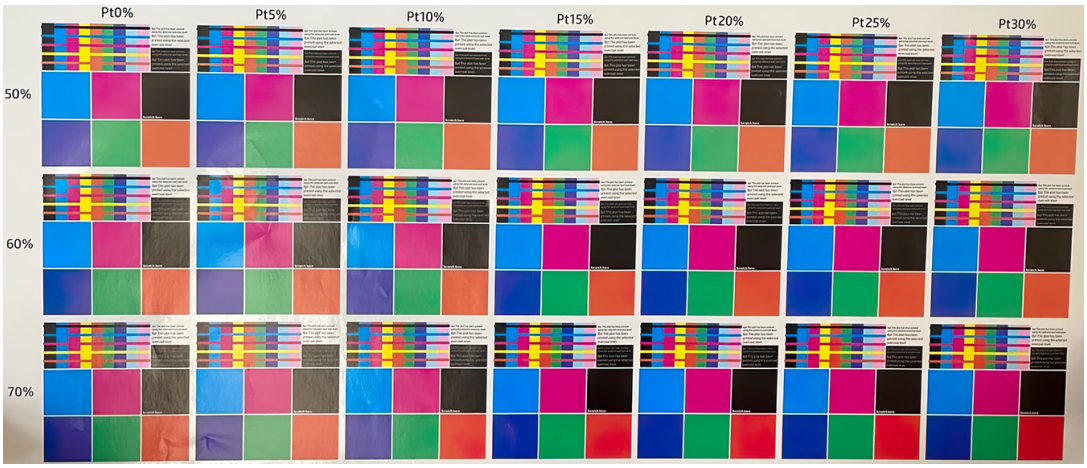
- **Print mode name**: Choose a name to identify the newly created print mode.

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)

- **CMYKcmW** (6 colors + white)

- **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 Available print modes on page 87.
- Save the settings.
- Load the substrate, if it is not already loaded.
- Tap **Print test** to print the ink drying and color saturation test.



Follow the instructions on the print to assess the results:

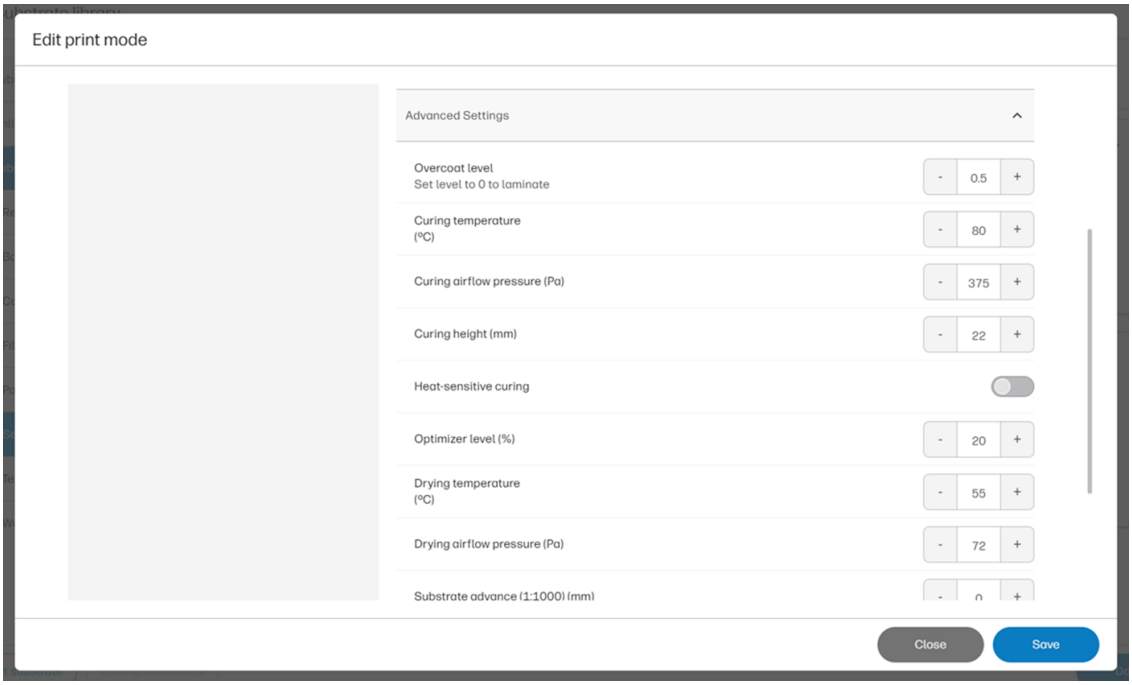
- Check the bleeding and coalescence to identify the correct ink density and the quantity of optimizer.
- For the chosen cell, check the durability by scratching the print with your fingernail.

Move on the next step and adjust the values according to your observations of the test print.

9. Select your 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.

  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 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.

  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.

Table 7-1 Recommendations

Setting	Unit	Recommended step change
Drying temperature	°C	5
Drying AF	Pa	10
Curing temperature	°C	5

Table 7-1 Recommendations (continued)

Setting	Unit	Recommended step change
Curing AF	Pa	100
PT	%	3
OC	level	0.5
Inter-swath delay	ms	250
Vacuum	Pa	50

10. Perform color calibration.

    Color calibration is recommended to ensure color consistency. The 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.

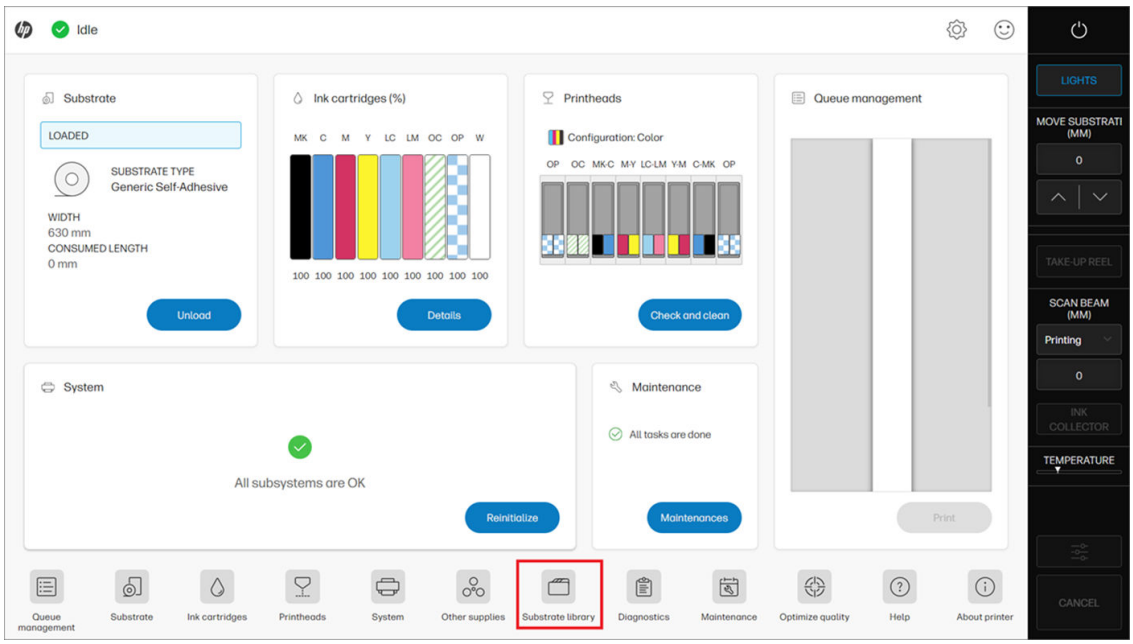
    Apart from adding a new print mode, you can alternatively print the ink drying and color saturation test with the existing print modes, but for a new substrate. The workflow is similar to adding a new print mode.

    For detailed information about print-quality troubleshooting, see Troubleshoot print-quality issues on page 288.

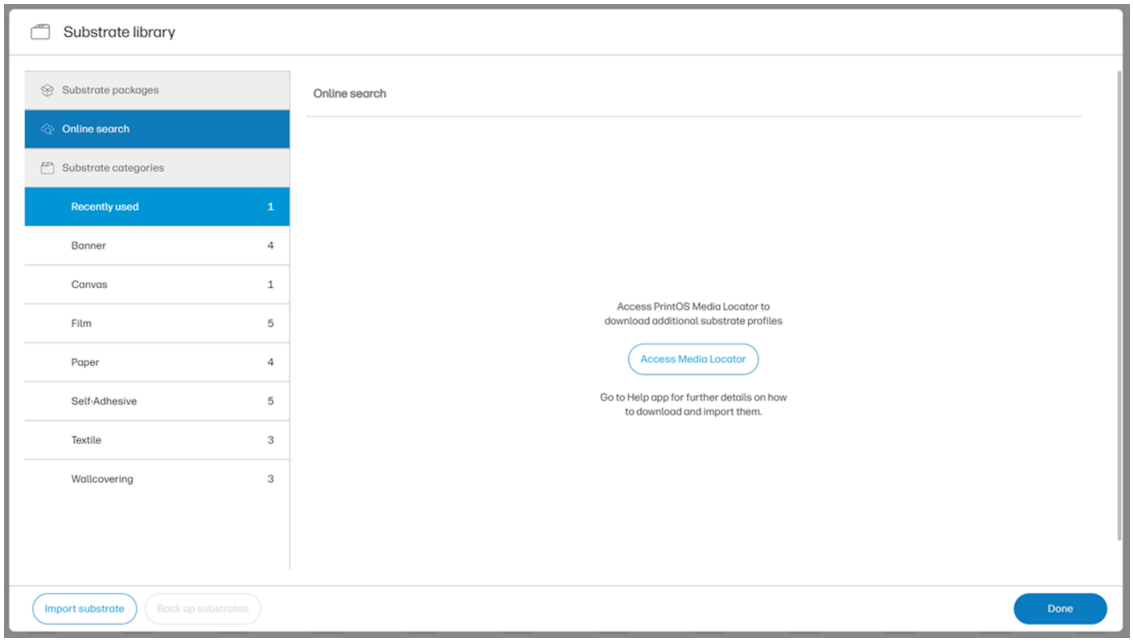
Online substrate manager

The online substrate manager allows you to search for substrates suitable for a particular purpose, and then to download and install a preset for whichever substrate you choose.

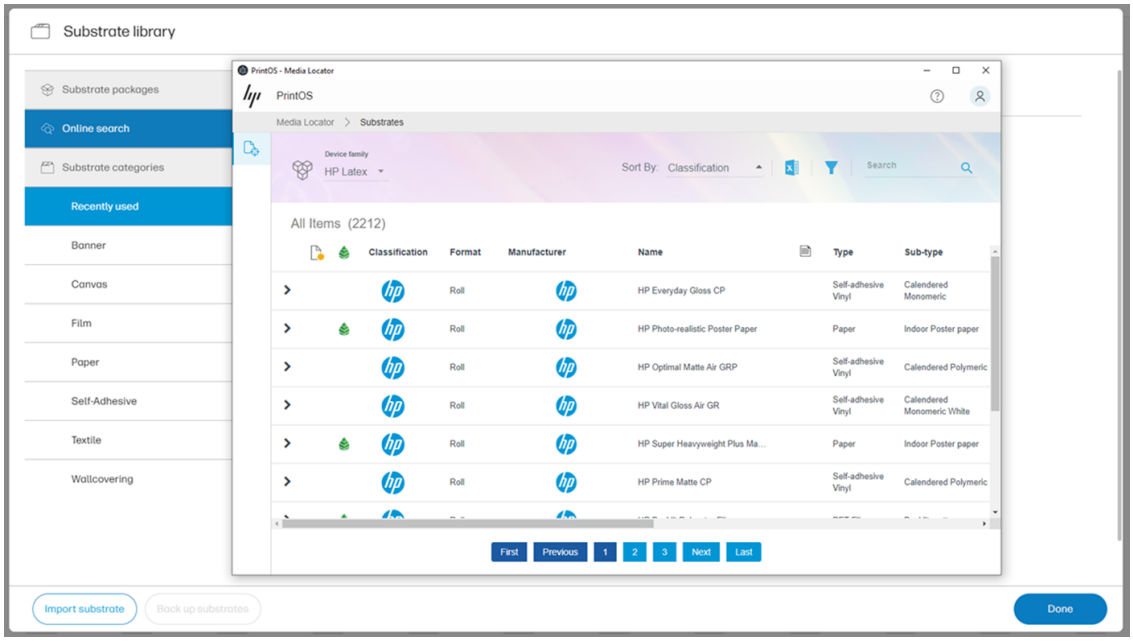
1. Go to the Internal Print Server and tap the Substrate Library icon , among the icons at the bottom of the screen.



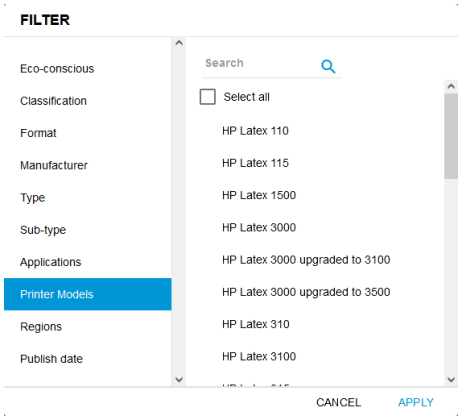
2. Tap **Online search**.
3. Tap the **Access Media Locator** button.



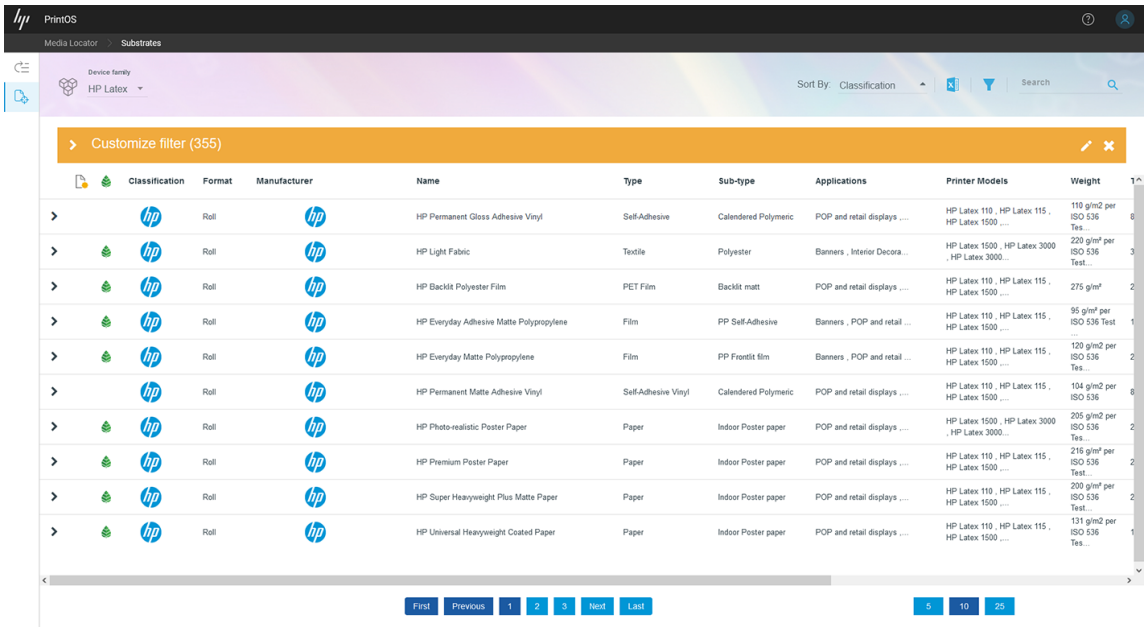
4. A new window opens for the HP Media Locator website.



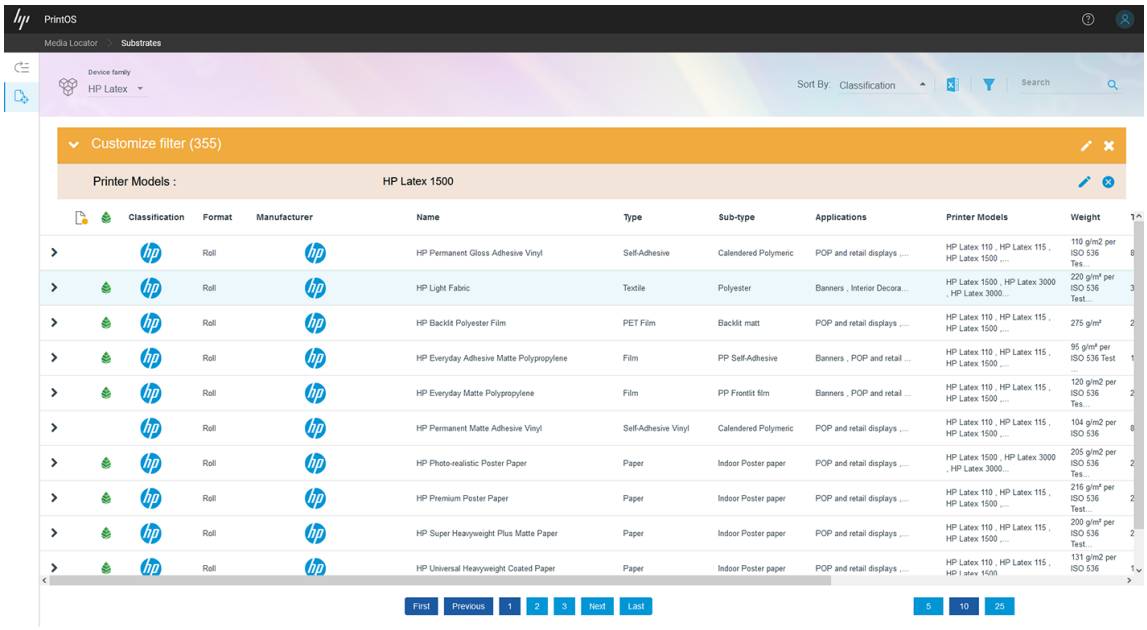
5. Tap the funnel-shaped filter icon near the top right of the window to filter the list of substrates by printer model, and select whichever printer you intend to use.



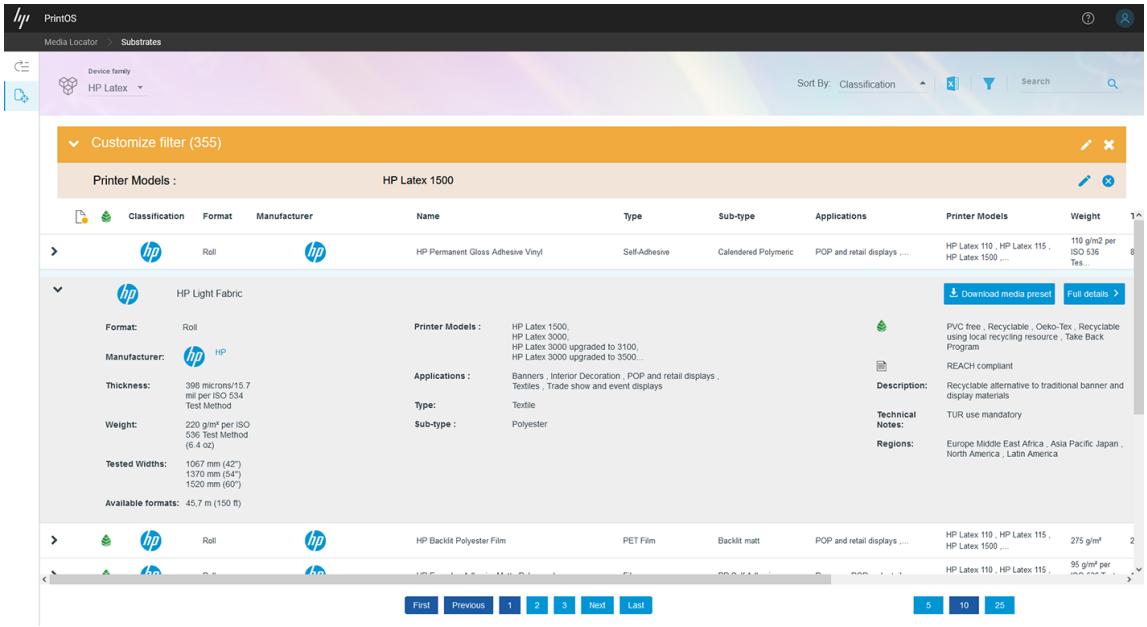
6. The list of substrates is now limited to those that match the filter condition.



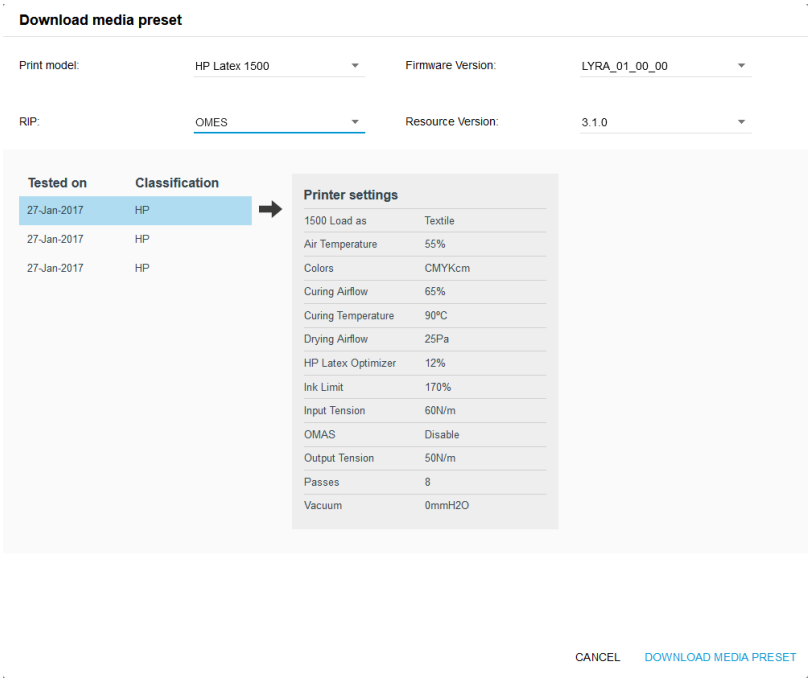
7. You can show all filter conditions by expanding the **Customize filter** title. You can then use the edit or remove icons on the right to modify or discard your filter criteria.



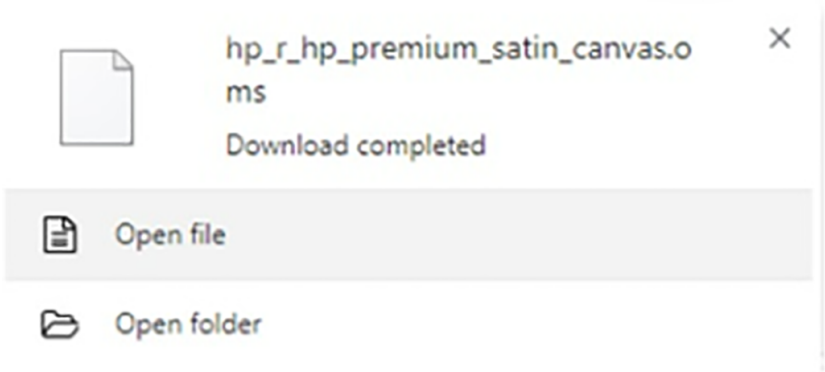
8. When you have chosen a substrate, use the icon on the left to show more details about it. To download the preset, tap the **Download media preset** button on the right.



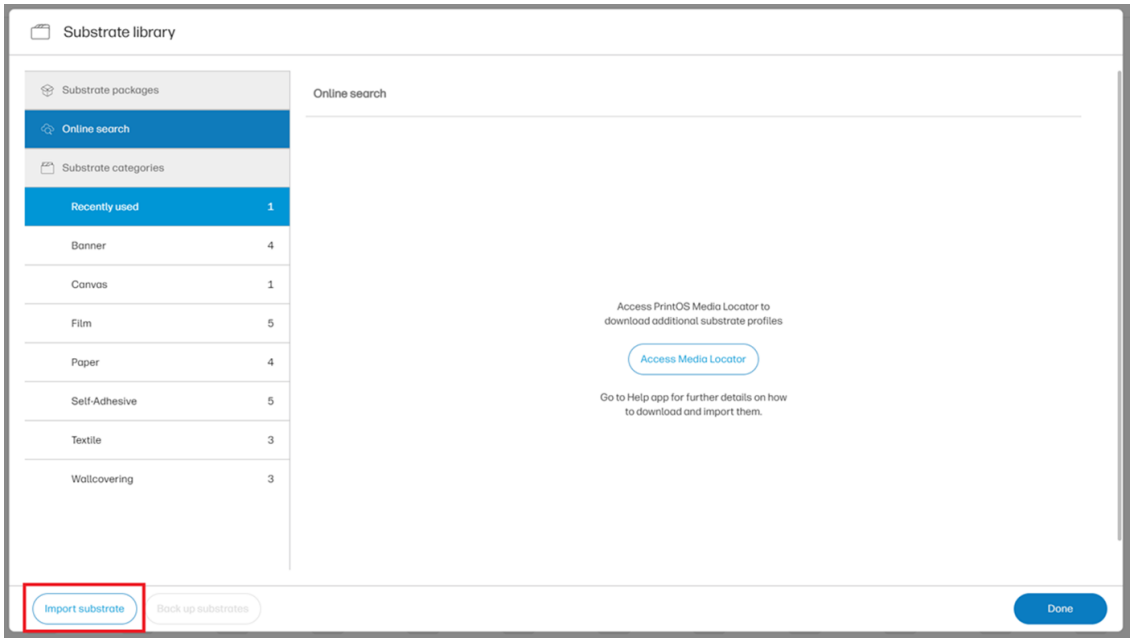
9. In the **Download media preset** window, select your printer model (again), and tap **DOWNLOAD MEDIA PRESET** at the bottom right.



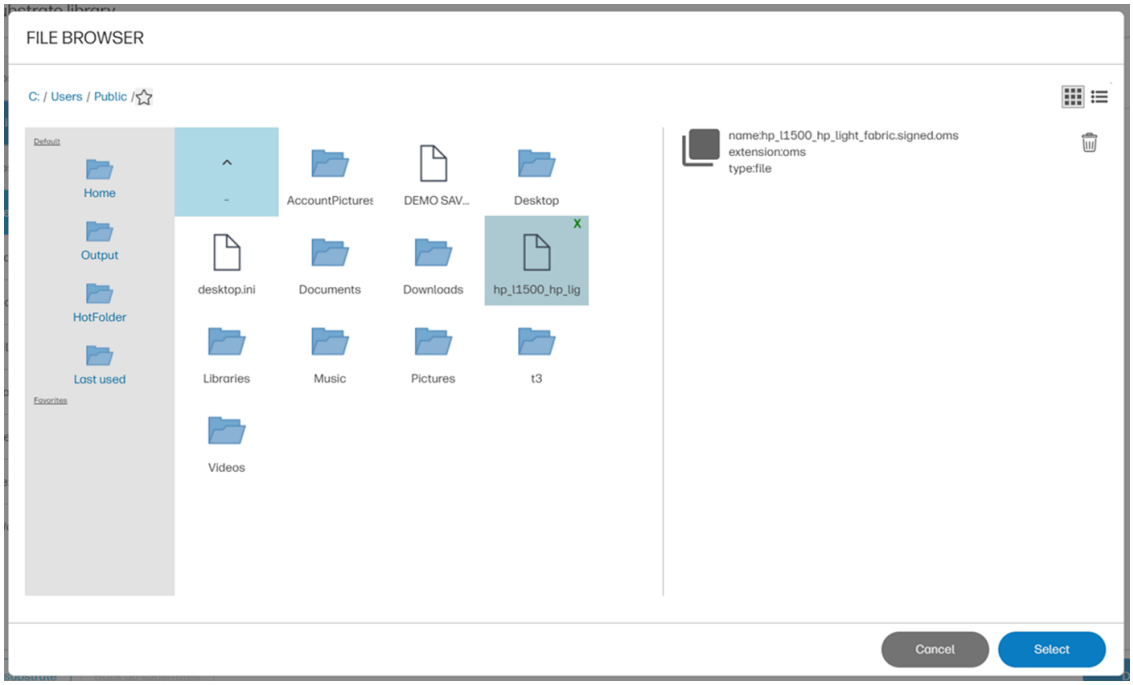
10. A file with the extension **.oms** is downloaded. Open the destination folder and copy or move it to a destination you can access from the printer.



11. Leave the Media Locator, return to the Internal Print Server's home screen, and tap the Substrate Library icon again. Then tap the **Import substrate** button.



12. Browse for the downloaded preset file.



13. Tap the downloaded preset file (with **.oms** extension), then tap **Select** at the bottom right of the screen.

NOTE: The installation process may take a few minutes.

When the installation has completed, you can find the new substrate preset in the list of available substrates, in its appropriate category.

Edit a substrate preset

The following sections provide details for this topic.

Optimize for printing speed

If your priority is to maximize speed of printing, try this suggestion.

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°C steps.

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

Optimize for print quality and/or gamut

If your priority is to obtain the best print quality and/or the widest gamut, try these suggestions.

Actions

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

- Increase the ink density.

Considerations

- A six-color ink set enables smooth transitions; always use this option for best print quality.
- Use an eight- or ten-pass print mode for best print quality.
- When using a high number of passes, substrates can be saturated above 100% ink (example: 130% frontlit, 200% 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

If your priority is to minimize ink consumption, try these suggestions.

Actions

- Reduce the ink density.
- Use a four-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 four-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 four-color ink set is less resistant to some print-quality defects, such as contouring.

Available print modes

This topic provides a full set of reference information for this subject.

Figure 7-1 HP Latex FS50/FS60 and FS50 W/FS60 W

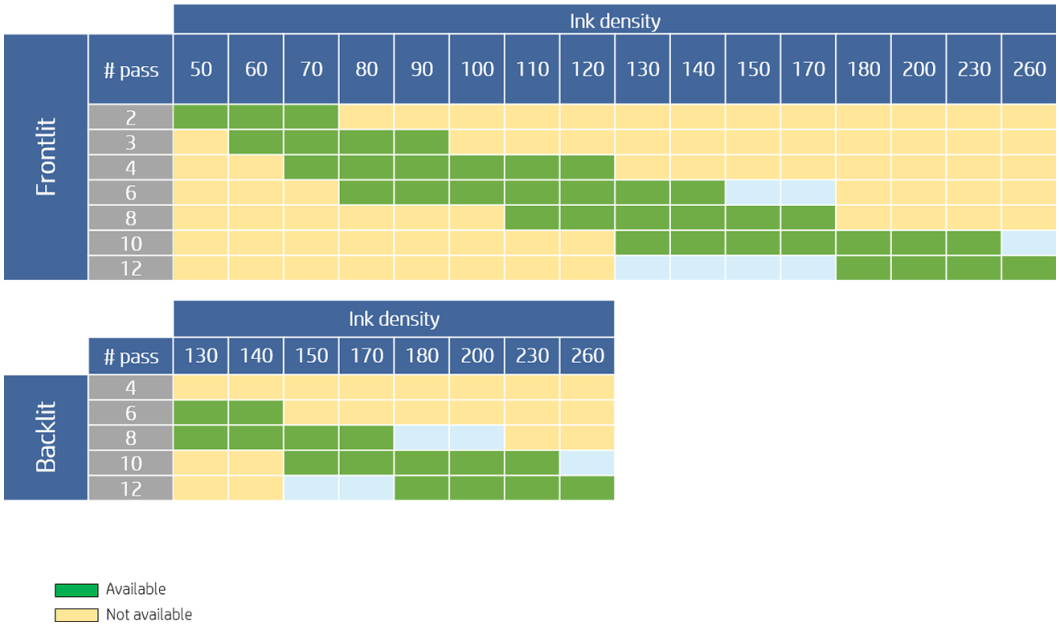
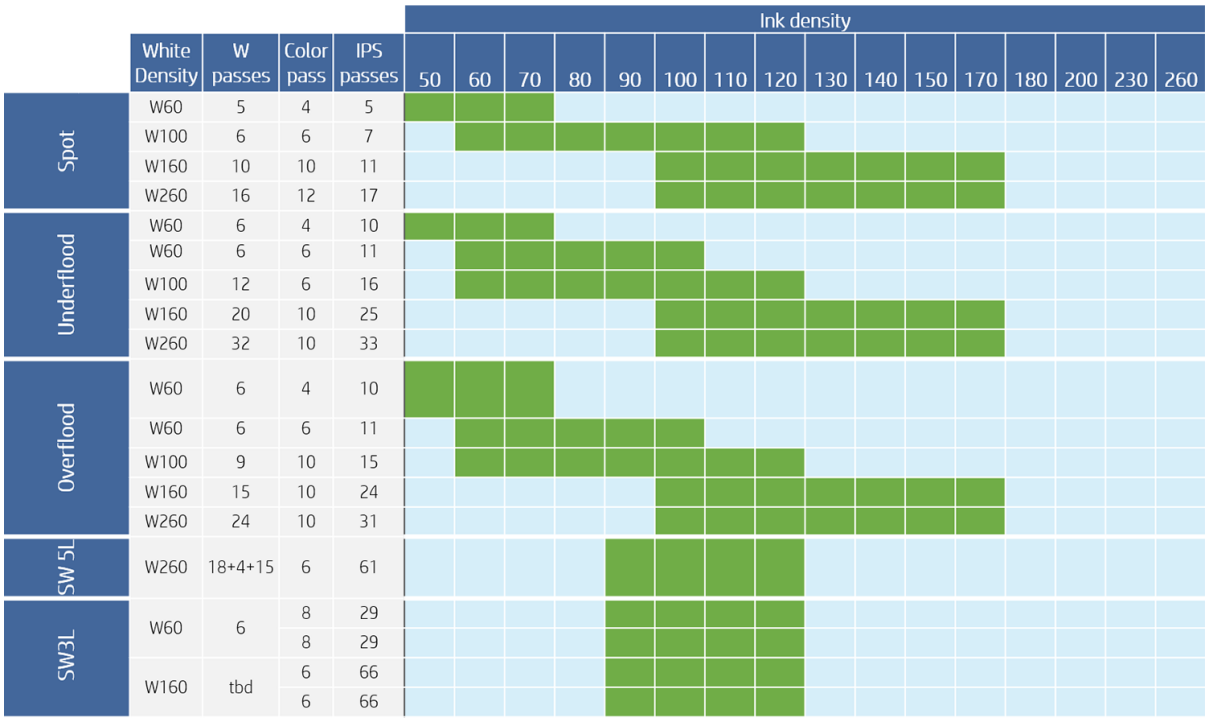


Figure 7-2 HP Latex FS50 W/FS60 W only



Adjust the printing workflow for optimum color performance

The following steps provide the complete procedure for this topic.

1. Check your substrate's color calibration status and calibrate it if recommended, by tapping **Substrate** > **Color calibration** in the Internal Print Server. See Color calibration on page 142.
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.

Tap the Substrate Library icon , 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.

Export multiple presets

Multiple substrate presets can be exported together in a single .oms substrate file.

Job properties

The Job Properties window is displayed when you import a job into the Internal Print Server.

Double-sided

Double-sided printing helps you to print rows of images on both sides of the substrate.

- There is a process to guide you when printing a substrate on both sides.
- Double-sided printing can be used to print the same image or different images on each side.
- The process automatically compensates for any registration errors, of the position of the plot, along both axes (along the substrate width + substrate advance) to minimize any errors.
- The dual-roll spindle cannot be used when printing double-sided.
- The images of Side A and Side B must have the same dimensions. The image that you select for each side must be the same image for the entire side.

Create a job

Any image created in the RIP can be printed on either side A or side B, without any special requirements.

However, side A and side B must have the same dimensions when printed on the substrate.

NOTE: In order to minimize registration errors on some substrates, you are recommended to compensate for substrate contraction in the RIP when the image is generated.

Define double-sided job

The following steps provide the complete procedure for this topic.

1. Open the **Job Properties** window of any job.
2. Enable the double-sided view, to show both sides in the preview area on the right.
3. You can replace one of the sides with another image from the Inbox, or leave the job as it is, with both sides showing the same image.

4. After selecting one of the sides in the preview, you can assign the appropriate substrate and print mode to it, which may or may not differ from the those assigned to the other side, depending on physical substrate properties.

   You can also use the **Check both images** button to compare the images of the two sides at 50% transparency.

   NOTE: Any change that affects the placement of the image on side A (such as adding margins) will automatically be applied on side B, to maintain correct registration.

5. Once the double-sided job has been composed, save the file. A new cluster will be created to hold the jobs that belong to more than one type of substrate.

Print

Follow these steps to print a double-sided job.

1. Drag the job to the queue.
2. Two parallel queues are created instead of one: one for side A and one for side B.
3. Tap **Print** on the one you want to be printed.

   Bear in mind that, if you decide to print side B, the printer will look for the registration lines previously printed on side A. The printed side A must already be loaded correctly so that the registration line can be found.

Nesting

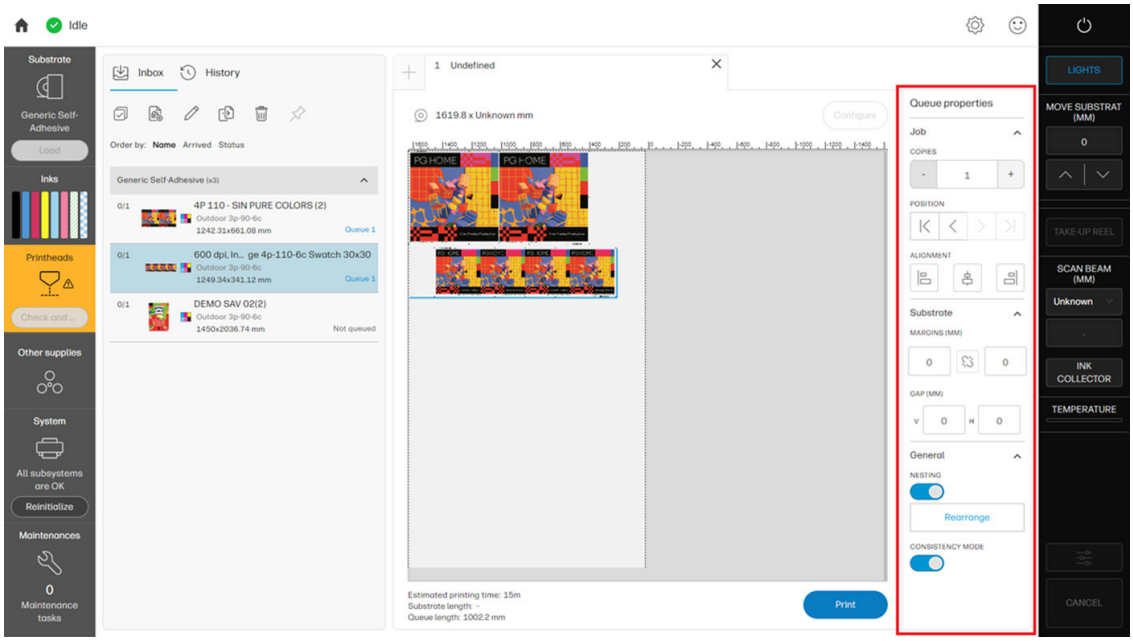
Nesting is a layout method that allows you to choose the layout of your printed jobs on the substrate, relative to one another, instead of simply printing them one after another as usual. Jobs can be printed side by side if there is room.

TIP: Printing jobs side by side on the substrate gives you faster throughput and uses less substrate.

You can use nesting in the Internal Print Server by enabling the **Nesting** option from the queue settings panel.

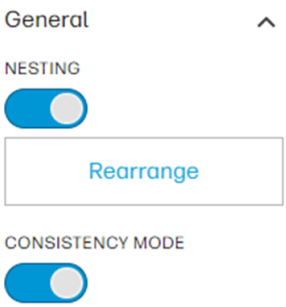
Queue settings panel

If you select only one job, nesting is not possible and the option is grayed out. If you select more than one job or more copies of the same job, you can tap the option to enable nesting.



NOTE: To be nested together, jobs must have the same selected substrate, resolution, number of passes and jobs must be aligned equally (for example to the left). Any incompatible job is added to the queue as a separate, non-nested job.

The **Group copies** option groups copies of the same job together in the print queue.



The **Rearrange** button automatically optimizes the positions of the images, grouping them by the number of passes and resolution, in order to maximize the usage of the substrate.

When you are satisfied with the layout, you can proceed to print.

Set the carriage beam position

The carriage beam position determines the vertical distance between the printheads and the platen. If it is too great, print quality will be impaired. If it is too small, there is a risk that the printheads will come into contact with the substrate, causing smears or damage.

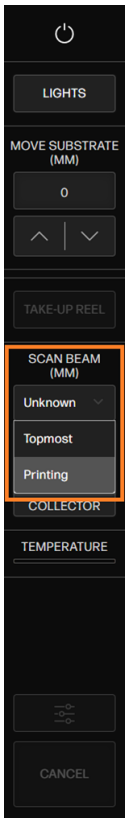
- The **substrate-load** position is not used for printing: it may be used for loading thick substrates or for maintenance tasks.
- The **printing** position is a fixed height suitable for unwrinkled substrates up to 0.4 mm (0.016 in) thick.

- A **custom** position is used for substrates thicker than 0.4 mm (0.016 in), or for substrates that wrinkle slightly due to heating. HP recommends setting the custom position as follows:
  - The thickness of the substrate plus 1.9 mm for substrates that do not wrinkle.
  - The thickness of the substrate plus 2 to 3 mm for substrates that wrinkle.

  You cannot exceed the maximum height permitted by the Internal Print Server.

TIP: Try to avoid wrinkling by using substrates that do not wrinkle, or by using a slower print mode that will allow you to lower the drying and curing power.

To set the carriage beam position, go to the Internal Print Server and select the appropriate position from the drop-down list.



WARNING! Keep away from the printer's moving parts until the carriage beam has reached its new position.

CAUTION: Do not change the carriage beam position while the printhead cleaning roll is out of place.

8 Handle the ink system

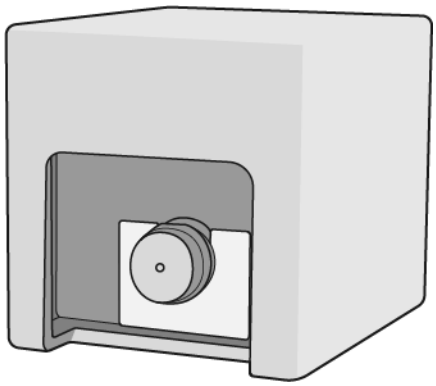
The ink system manages the ink that is used to print on the substrate.

Ink system components

The ink system consists of a number of separate hardware 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.

⚠ **CAUTION:** Observe precautions when handling ink cartridges because they are ESD-sensitive devices (see the Glossary on page 350). Avoid touching pins, leads, and circuitry.

NOTICE: This printer is intended to work only with cartridges that have a new or reused HP chip, and it uses dynamic security measures to block cartridges using a non-HP chip. Periodic firmware updates will maintain the effectiveness of these measures and block cartridges that previously worked. A reused HP chip enables the use of reused, remanufactured, and refilled cartridges. More at: www.hp.com/learn/ds.

NOTICE: 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.

NOTICE: 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:

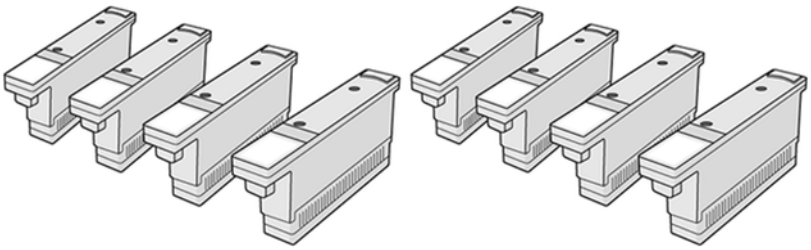
- Always disconnect cartridges from the printer before handling them.
- Never place anything heavy—more than 1 kg (2.2 lb)—on top of a cartridge.

- 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 350). Avoid touching pins, leads, and circuitry.

The printer's six-color writing system uses five dual-color printheads, two optimizer printheads, and one overcoat printhead. The position of each printhead in the carriage is shown in Carriage view on page 14.

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 put into any slot except the optimizer slot, 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.
- White printheads (for the FS50W/FS60 W printer only) can be put into slot 7 only, replacing the CK printhead.

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.

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 lifespan of a single roll depends on how the printer is used; differences can be significant. For example, a single roll can last 20 L with low-productivity printing, 30-40 L with average productivity, or more than 60 L with really high-productivity printing.

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 119. 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 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, following the steps in the maintenance widget, 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; the right blades should last for several cleaning rolls. 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 (following the instructions of 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 machine will request a foam change approximately every 25% of the cleaning roll usage.

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.

Printhead-cleaning waste bottle

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

You should empty the waste bottle whenever the printhead cleaning roll is replaced.

IMPORTANT: You should also empty the waste bottle when all or most of the printheads are changed, because purging them could fill more than half of the waste bottle.

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

Distilled water tank

The distilled water tank has a capacity of 9 liters and should be filled with distilled water whenever the printhead cleaning roll is replaced, or when prompted by the printer.

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

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

IMPORTANT: When the printer has signaled that the water tank is empty, you should be able to put at least 5 liters of water into it. If not, clean the water-tank filter (a maintenance operation).

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.

Condensation collector bottle

The printer has a system that collects most of the vapor generated while drying and curing the ink and condenses it in a bottle located at the left side of the printer.

You should check the bottle every time you replace the printhead cleaning roll, and empty it when necessary. Consult your local authorities to determine the correct manner in which to dispose of wastes.

The waste-profile datasheet contains the required information for an adequate disposal. You can find the datasheet at the HP Latex Knowledge Center: https://hplatexknowledgecenter.com/applications/wasteprofiles/.

⚠ CAUTION: Make sure the bottle is pushed all the way into its support, to avoid condensation leaks.

⚠ CAUTION: Make sure condensation tubes are pointing to the condensation bottle funnel, to avoid condensation leaks.

How to work with ink system components

In the short term, the ink system works without human intervention. However, you will need to intervene occasionally to keep it running in the long term.

Ink cartridge compatibility

Your printer now supports the use of new high-capacity ink cartridges, which hold up to 10 liters of ink. This enhancement allows for longer print runs without the need for frequent cartridge changes, improving efficiency and productivity.

Additionally, the printer maintains compatibility with the older 5-liter cartridges, providing flexibility in ink management. Users can seamlessly mix and match the 10-liter and 5-liter cartridges within the same printer, ensuring continuous operation and the convenience of using existing ink supplies.

Ink cartridges

The following sections provide details for this topic.

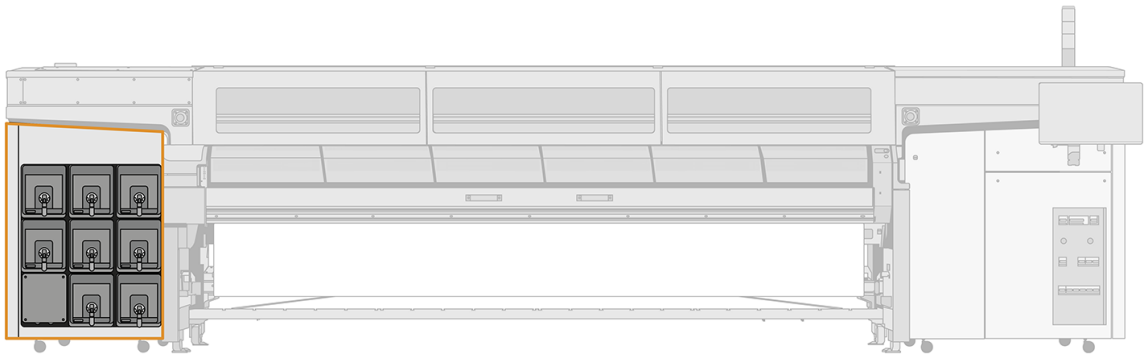
Remove an ink cartridge

An ink cartridge should be removed and replaced when it is empty or past its expiry date.

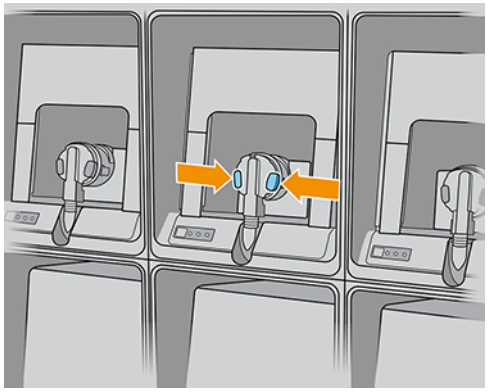
An empty cartridge is indicated in the Internal Print Server and by a red light beside the cartridge itself. You may also decide to remove a cartridge if it contains little ink and you want to provide for a long period of unattended printing.

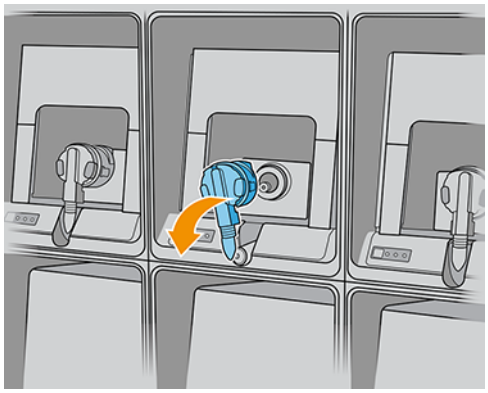
The printer can continue printing without any ink cartridges for at least 10 minutes, depending on the print mode and the job being printed. Therefore, cartridges can be replaced while printing continues. A functional ink cartridge is required in order to start a new job.

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



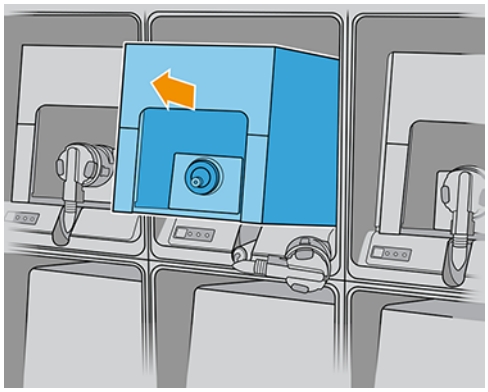
2. Disconnect the cartridge connector by pressing the tabs on each side of it and pulling it gently away from the cartridge.





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.



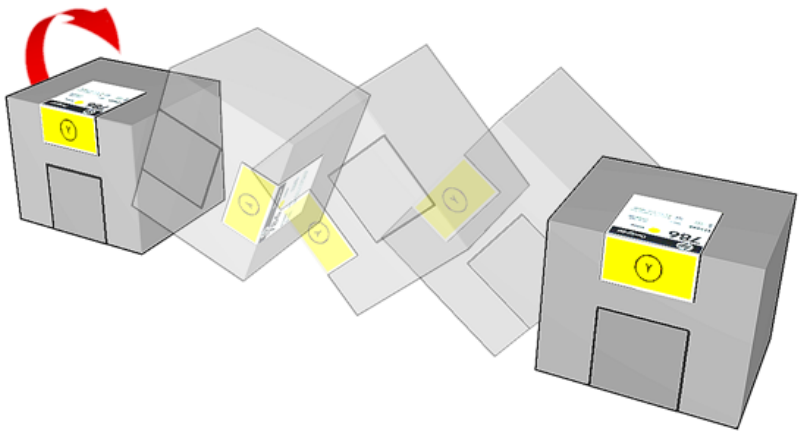
Insert an ink cartridge

The following steps provide the complete procedure for this topic.

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

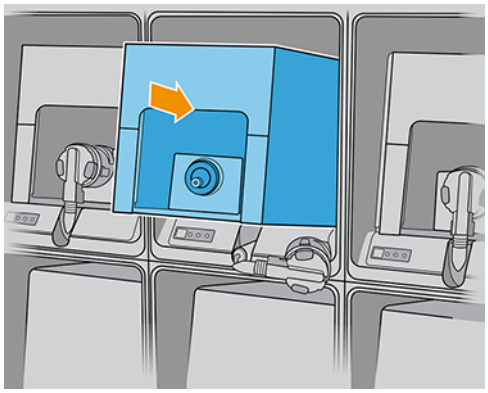
The FS60 and FS60 W printers accept 5L and 10L ink cartridges that are interchangeable.

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.



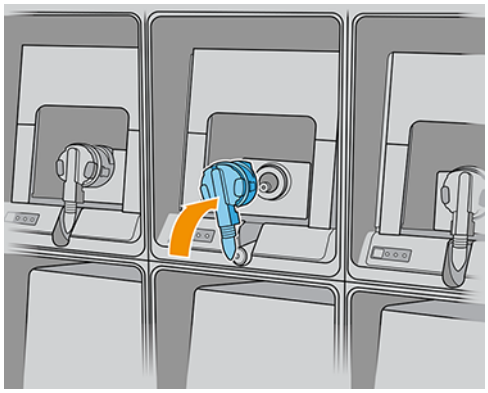
3. Tear off the square and fold it inside the handle as illustrated.
4. Put the new cartridge into its correct place on the printer.

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



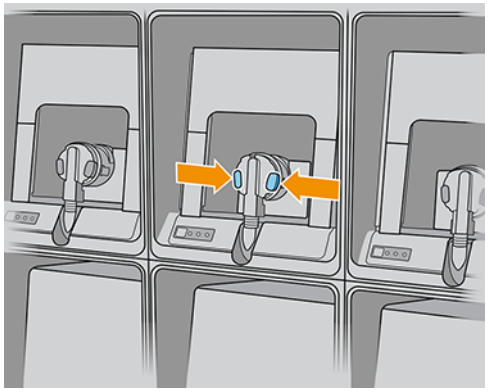
5. Check that the rubber part around the needle in the cartridge connector is clean. Clean gently if necessary.

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.

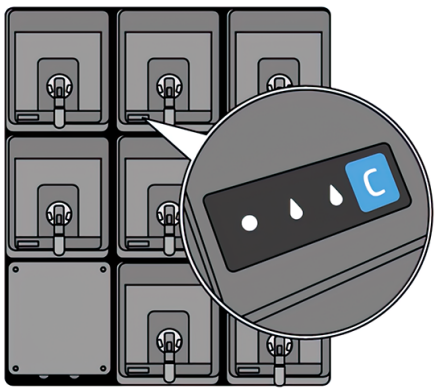
Maintain the ink cartridges

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 30.

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.

NOTE: The level of the ink cartridges may vary due to ink being used to refill the intermediate-tank.

Printheads

The following sections provide details for this topic.

Remove a printhead

The following steps provide the complete procedure for this topic.

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. No-one should be allowed to use the printer without this training.

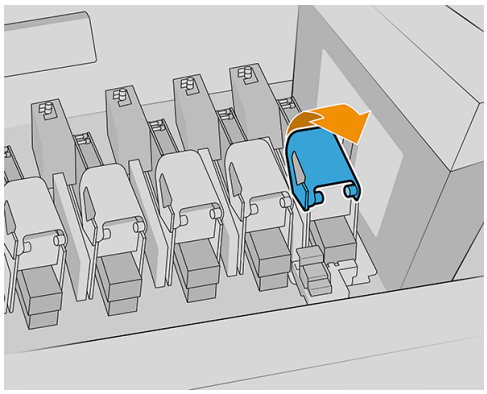
Table 8-1 Warning labels

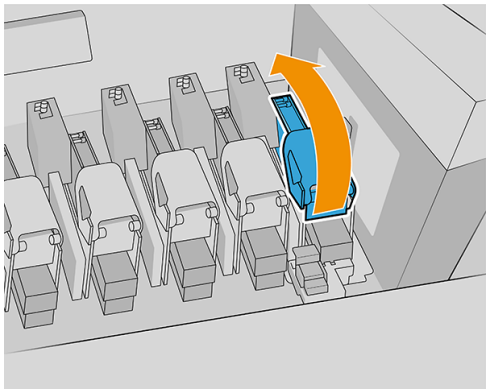
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

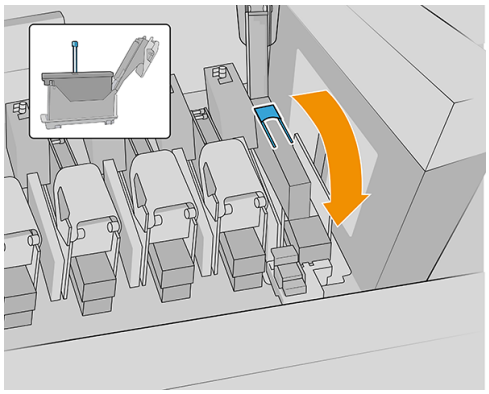
If a printhead develops an electrical fault or overheats, the Internal Print Server will indicate that it should be reseated or replaced. In addition, you may wish to replace a printhead if its warranty has expired or if you feel that its performance is not adequate.

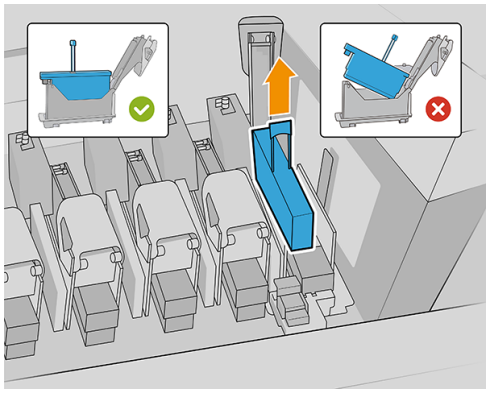
1. Ensure that the printer is not trying to print: stop the job queue.
2. In the Internal Print Server, tap the printhead widget, then **Replace**.
3. Open the carriage cover to access the printheads.
4. The Internal Print Server tells you which printhead to remove. Release the latch that secures the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



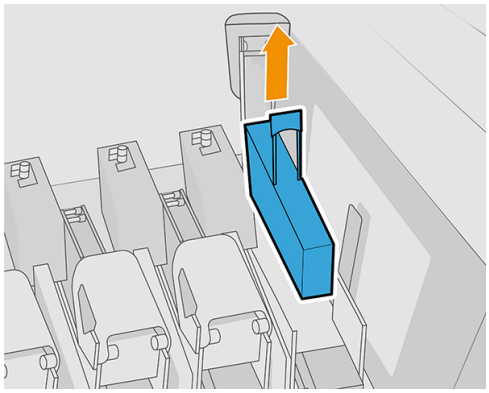


5. Lift the blue handle provided with the printhead, and pull the handle gently upwards to disconnect and extract the printhead from the carriage.





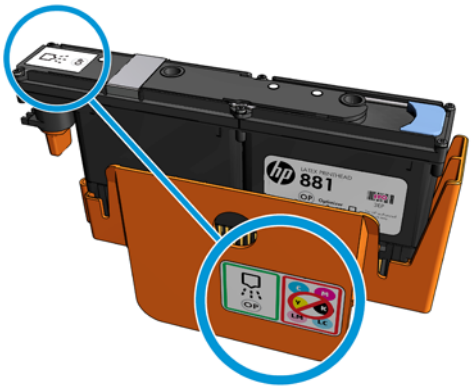
⚠ CAUTION: Remove the printhead slowly, as vertically as possible, without hitting any parts of the carriage or the sides of the slot. It may be damaged if you remove it too fast, or if you hit something.



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

The following steps provide the complete procedure for this topic.

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

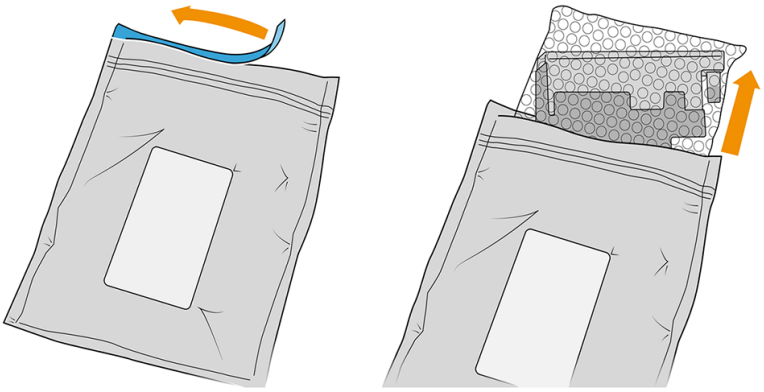
IMPORTANT: Once you have placed a printhead in a slot, it cannot be moved to another slot.

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

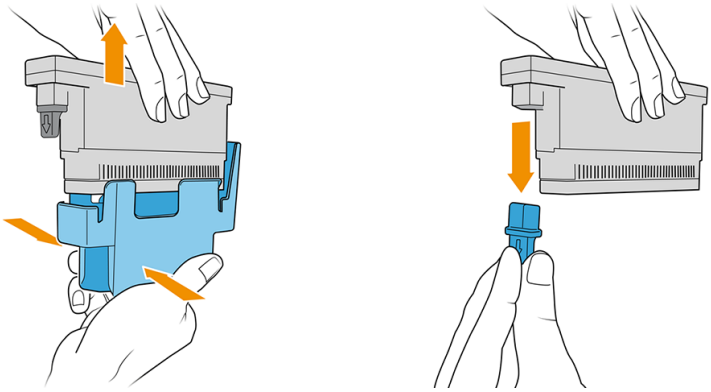
   NOTE: Each printhead has a unique shape and cannot be inserted into the wrong slot. Do not try to force it.

2. Remove the packaging from the new printhead.

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

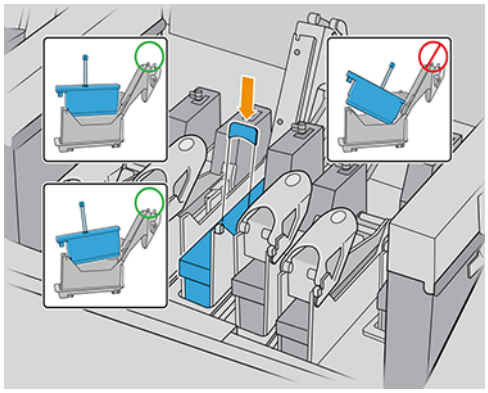


3. Remove the protective caps.

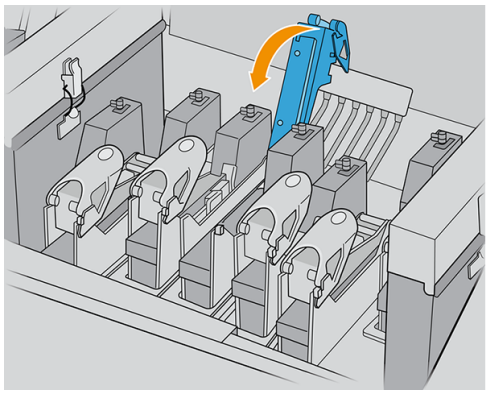


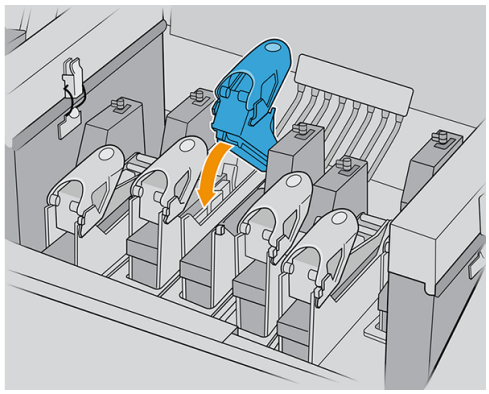
4. Put the new printhead into its correct place in the printer, and lower its handle.

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.

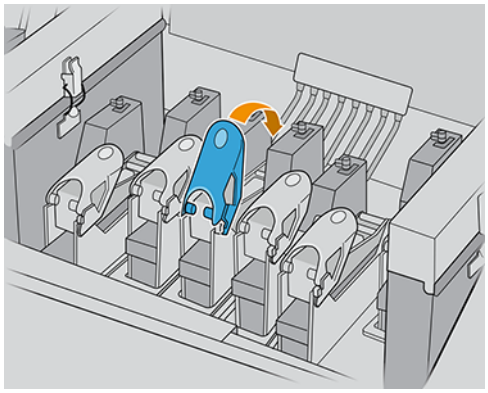


5. Lower the latch until it lies on the printhead.

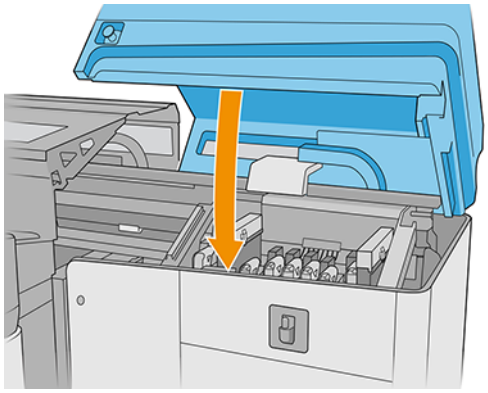




6. Secure the latch by opening it to fit the hook. Then close it.



7. 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 required for optimal print quality.

IMPORTANT: When all or most of the printheads are changed, you should empty the printhead-cleaning waste bottle, because purging the printheads could fill more than half of the bottle.

IMPORTANT: Make sure the printhead cleaning roll door is closed while the printheads are being purged, to avoid ink spills outside of the printer.

8. Restart the job queue.

When all the printheads have been installed:

- The optimizer printheads in slots 1 and 8 will just be cleaned.
- Printheads in slots 2 to 7 will be purged with ink, which takes about 9 minutes for color and overcoat printheads in slots 2 to 7, and 14 minutes for a white printhead in slot 7 (FS50W/FS60 W only). The printer displays a message when purging is complete.

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.

The check and clean procedure can be scheduled to run automatically on specific days and at specific times, if the printer is powered on.

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 30.

Printheads should be aligned from time to time: see Align the printheads on page 136.

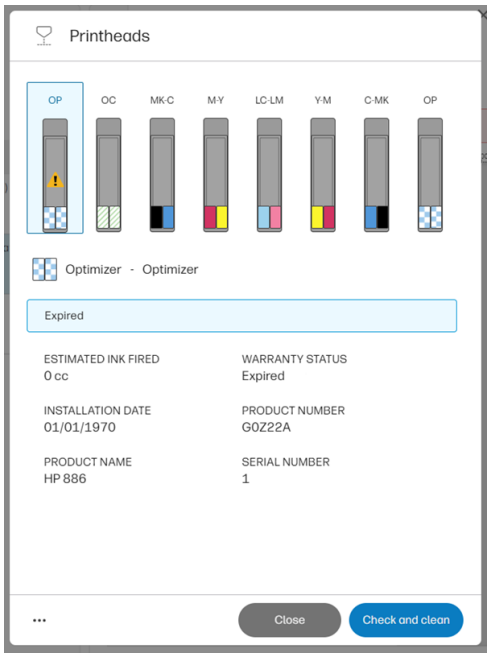
TIP: If you remove an unexpired printhead from the printer, planning to reuse it later, the best way to protect it is by replacing the protective caps that you removed before inserting it into the printer.

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

Check the printheads routinely before going into production.

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 cleaning**.

NOTE: You can minimize wasted ink by performing the check-and-clean operation just before starting production.

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

During the installation of the printer, the designated personnel received training for safe operation and maintenance of the printer.

NOTE: No-one should be allowed to use the printer without this training.

See video: https://www.youtube.com/watch?v=Bu9LRUJEISY.

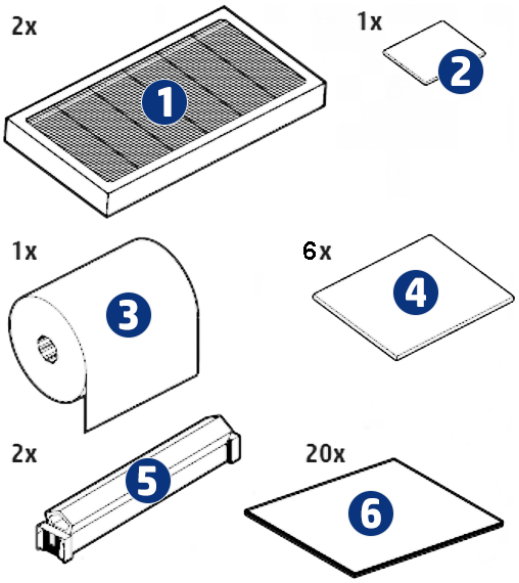
WARNING! This operation is limited to trained personnel only!

Table 8-2 Warning labels

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.

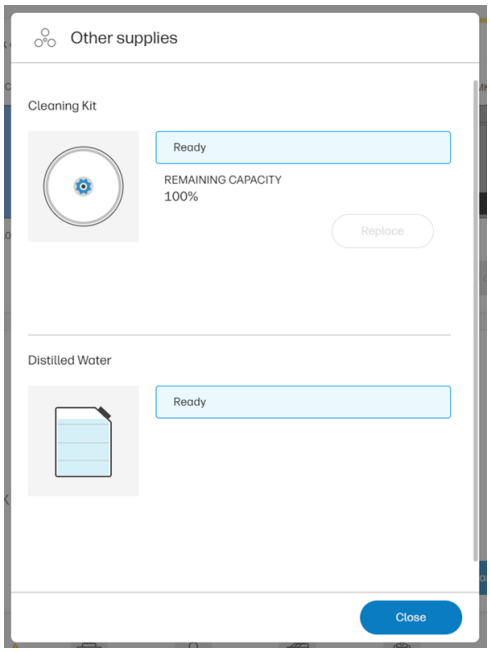


1. Aerosol filters (2)
2. Drop-detector foam (1)
3. Printhead cleaning roll (1)
4. Left spittoon foams (6)—use one at a time

5. Printhead cleaning hard blades (transparent) (2)
6. Cleaning wipes (20)

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 the **Other supplies** icon on the app bar, then tap the **Replace** buttton alongside the cleaning kit.



The wizard summarizes all the operations to be done.

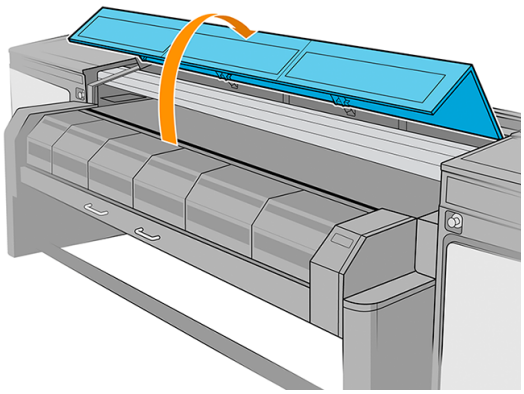
TIP: You are recommended to wear gloves.

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

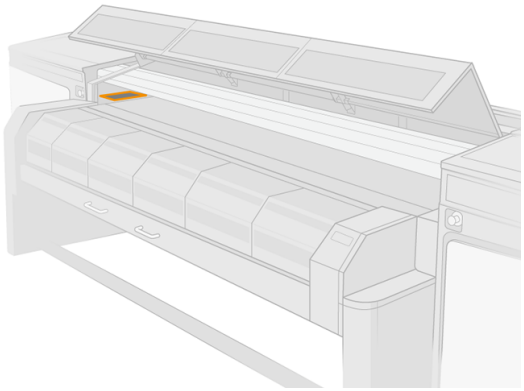
Replace the left spittoon foam

The following steps provide the complete procedure for this topic.

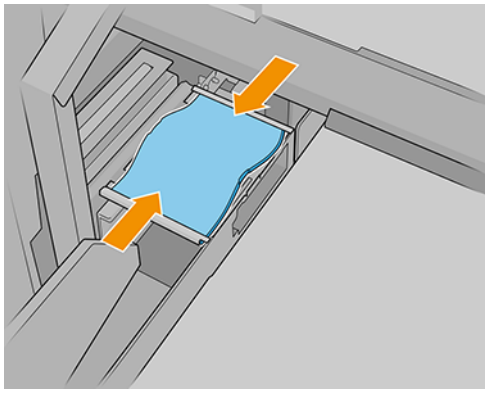
1. Open the window.



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



3. Remove the left spittoon foam, sliding the foam from right to left.

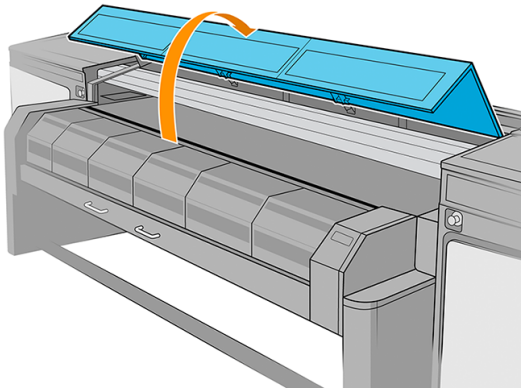


4. Insert the new foam into the left spittoon housing. Ensure that it is flat after installation.

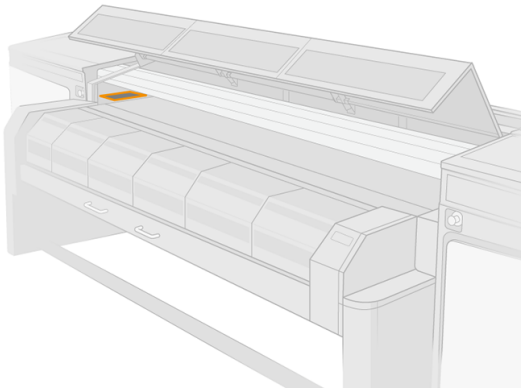
Replace the left printhead cleaning blade

The following steps provide the complete procedure for this topic.

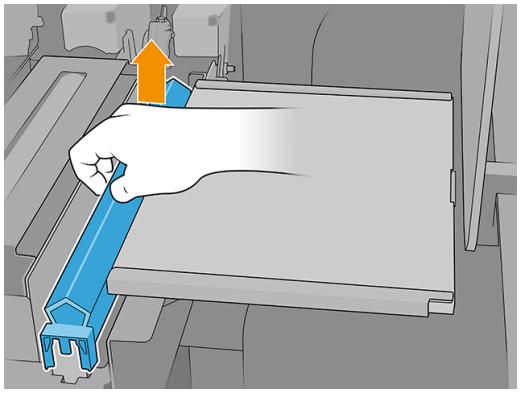
1. Open the window.



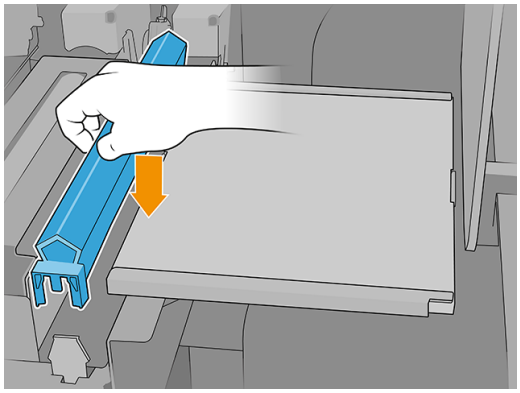
2. Locate the left printhead cleaning blade at the left side of the print area, beside the left spittoon.



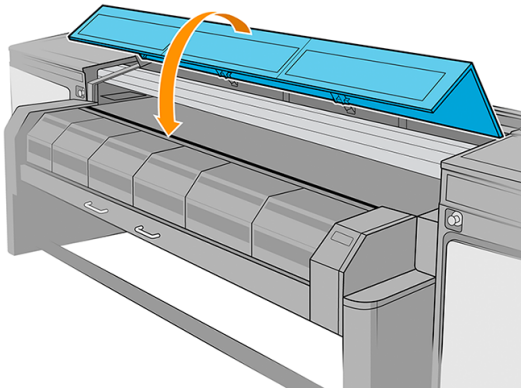
3. Grip the printhead cleaning blade in the center, and pull it out.



4. Insert the new blade.



5. Close the window.

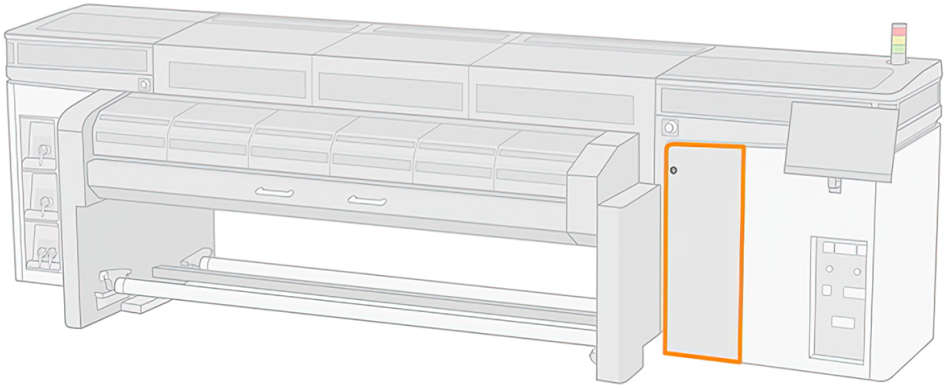


The printer automatically calibrates the blade height.

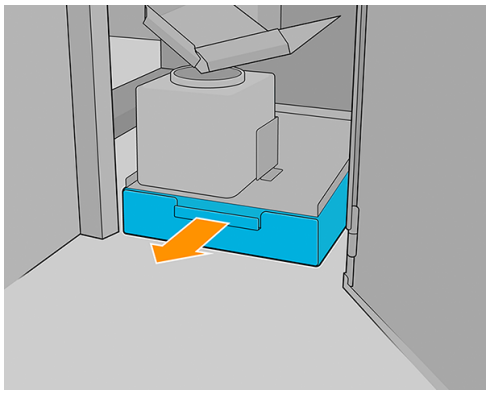
Refill the water tank

The following steps provide the complete procedure for this topic.

1. Locate the cleaning-roll door.



2. Open the cleaning-roll door and extract the water tank. Open the water tank lid.



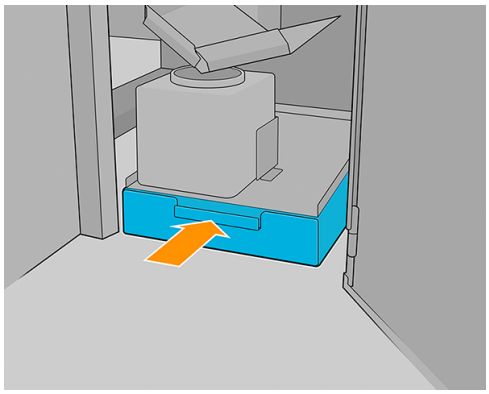
3. Refill the internal bottle with distilled water (not provided).

⚠ **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.

IMPORTANT: When the printer has signaled that the water tank is empty, you should be able to put at least 5 liters of water into it. If not, clean the water-tank filter (a maintenance operation).

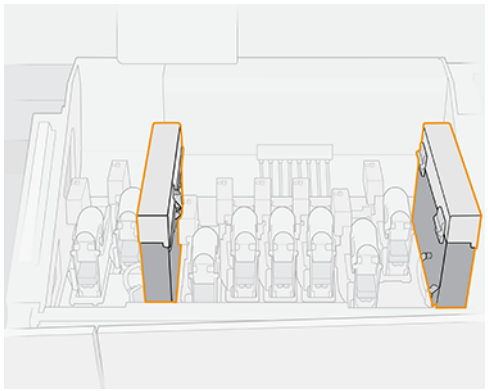


4. Close the water tank lid, push in the water tank, and close the cleaning-roll door.



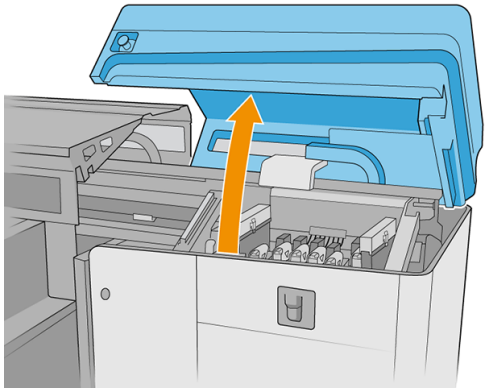
Replace the aerosol filters

The following steps provide the complete procedure for this topic.

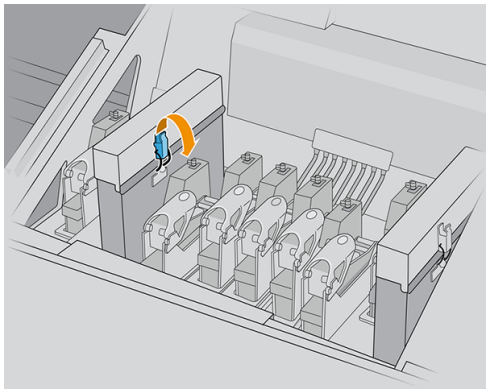


1. Ensure that all covers and doors are closed and remain in their original position.

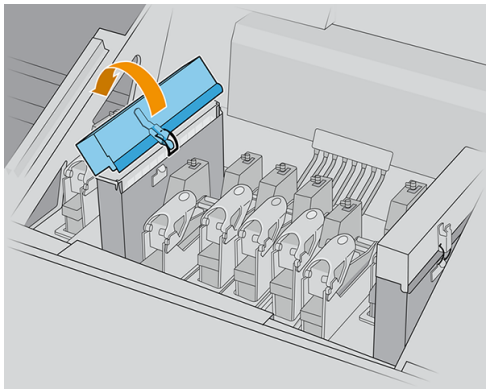
2. Open the carriage cover.



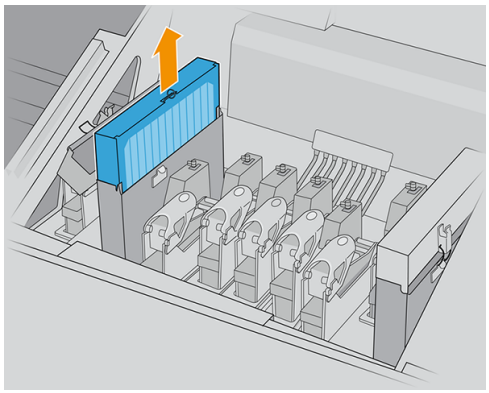
3. Open one latch on the right side of each aerosol filter module.



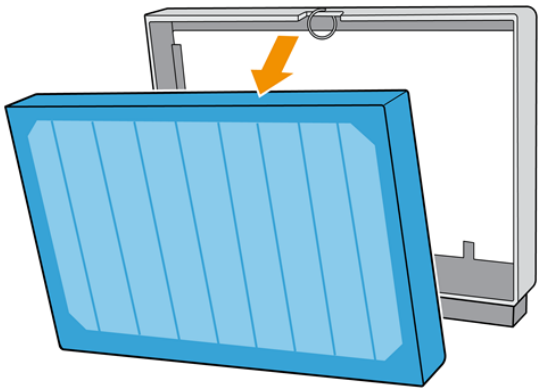
4. Open the lid of each filter.



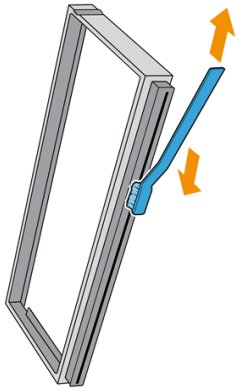
5. Extract the frame from the aerosol container.



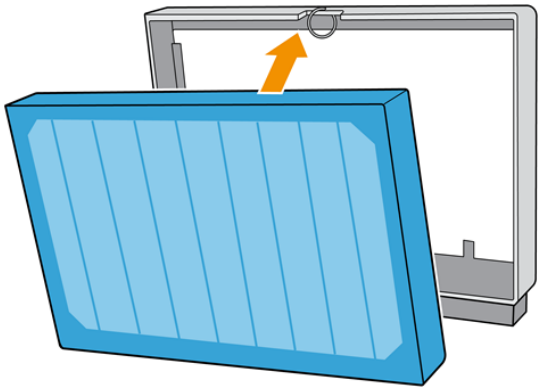
6. Remove the filter from the frame.



7. Clean the frame nozzle with the brush from the maintenance kit cleaning kit. Make sure to remove all accumulated fibers. Here if it is a cleaning task, the use of the **Latex FS50/FS60 User Maintenance Kit (3R743-67144 / 55P22A)** should be complemented with the use of the **HP Latex R Series & FS50/FS60 Cleaning Kit (K0Q45-67270 / 4BS24A).**

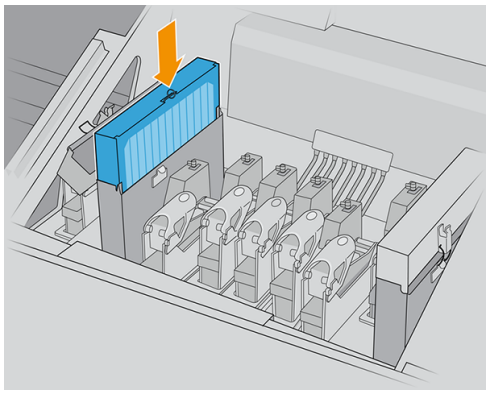


8. Insert the new filter into the frame.

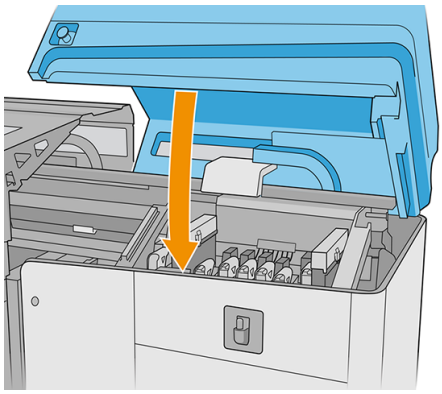


9. Insert the frame containing the new filter into the printer.

   There is only one way to insert the frames that works. If you feel resistance, try to insert the frame the other way round.



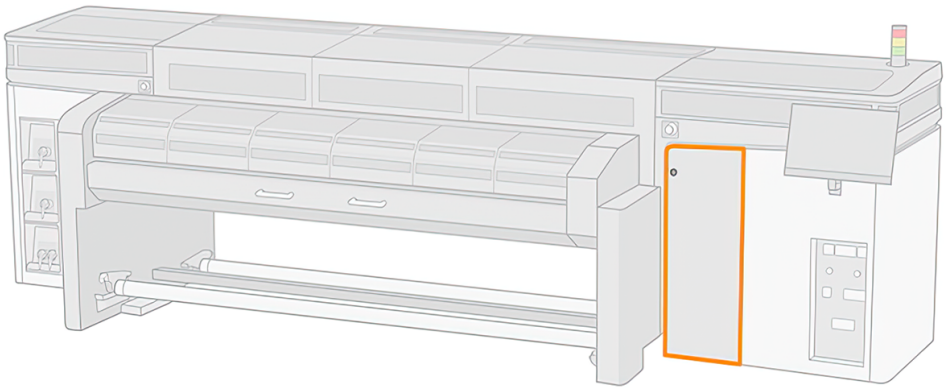
10. Close the lid.
11. Close the latch.
12. Repeat the same process with the other aerosol filter.
13. Close the carriage cover.



Empty the printhead-cleaning waste bottle

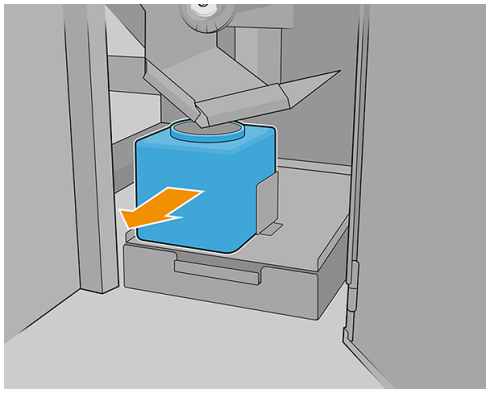
The following steps provide the complete procedure for this topic.

1. Ensure that the printer is not printing.
2. Unlock and open the printhead cleaning roll door.



3. Remove the waste bottle.

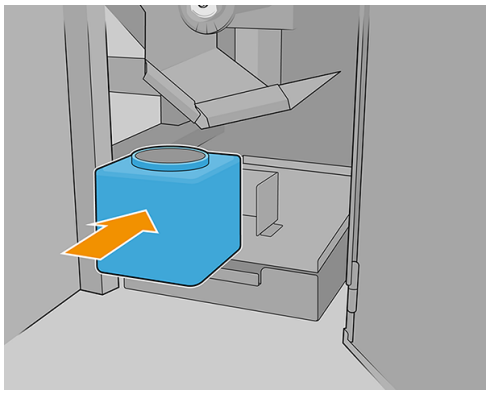
TIP: You are recommended to wear gloves for this operation.



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.

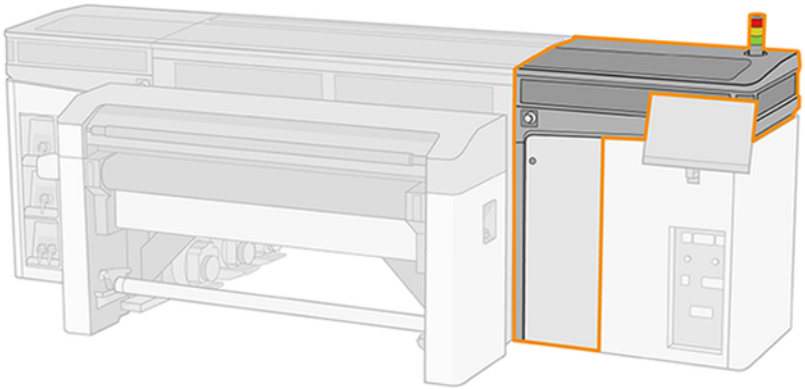


6. Close the printhead cleaning roll door.

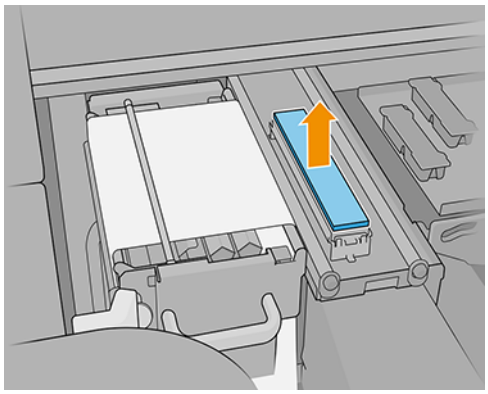
Replace the drop-detector spittoon foam

The following steps provide the complete procedure for this topic.

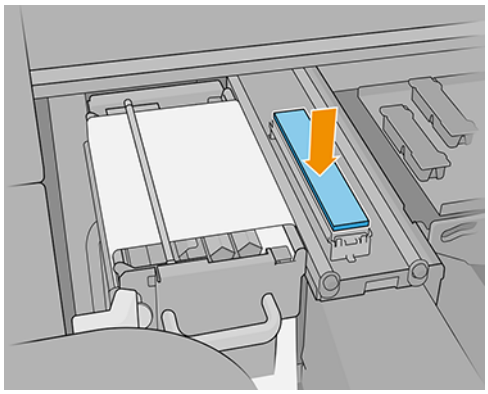
1. Unlock and open the printhead cleaning roll door on the front right of the printer, and open the carriage cover.



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.

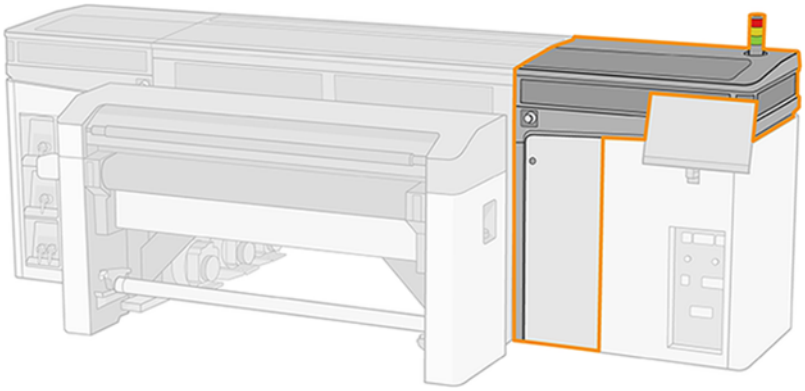
Replace the printhead cleaning roll

The following steps provide the complete procedure for this topic.

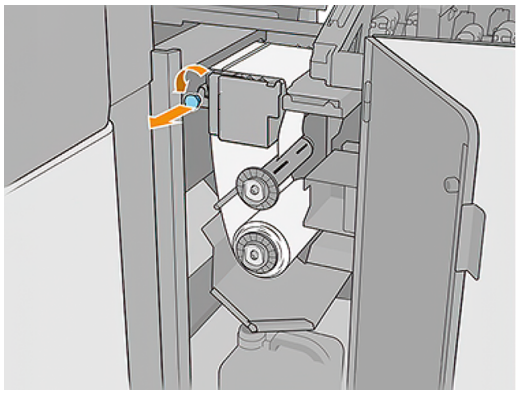
⚠ CAUTION: Do not insert the new cleaning roll until the Internal Print Server prompts you to do so.

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 cleaning roll, unlock and open the cleaning-roll door on the front right of the printer, and open the carriage cover.

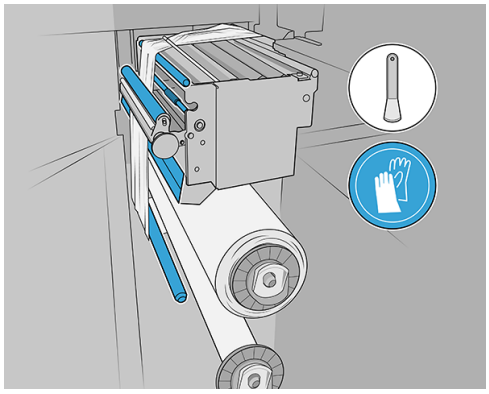


3. Pull the black knob on the upper left and move the pinch mechanism aside.



4. Remove the end of the roll and use it to remove all ink waste, dry ink, and fiber particles from the following components:

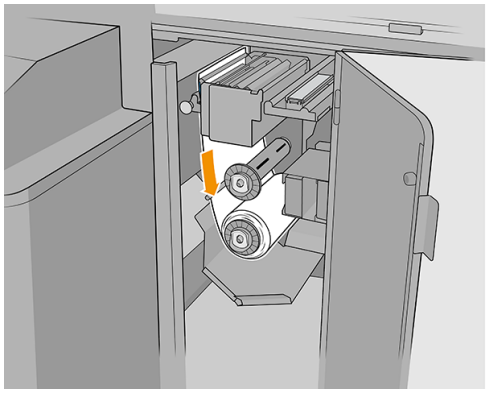
   - Orange printhead cleaning blade
   - Transparent printhead cleaning blade
   - Middle diverter (clean the whole surface)
   - Sloping surfaces (use a putty knife if necessary)
   - Left diverter
   - Left latch
   - Drive roller
   - Pinch driver
   - Pinch roller

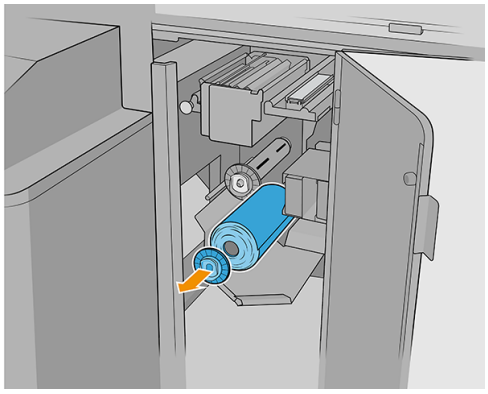


IMPORTANT: Clean the pinch roller carefully with a sponge and distilled water. Errors may occur if it is not clean.

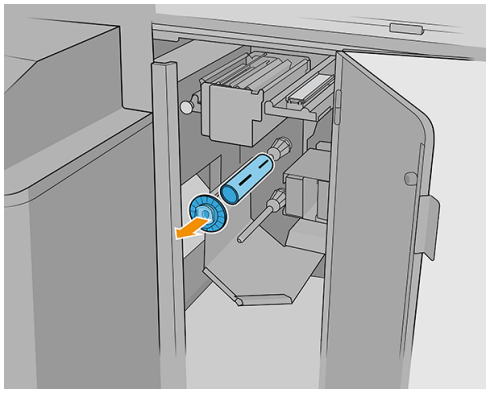
Also clean the tray under the pinch driver, using a sponge or putty knife.

5. 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.



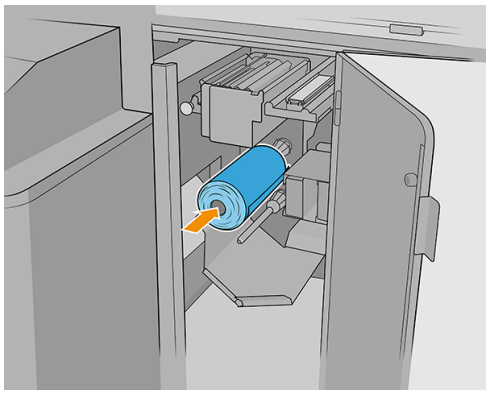


6. Keep the empty core to use as a takeup core.

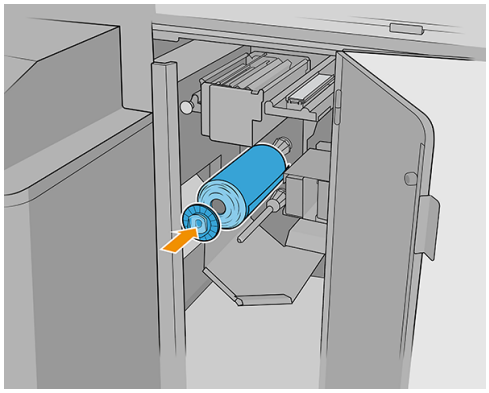


7. Slide the new roll onto the upper axle.

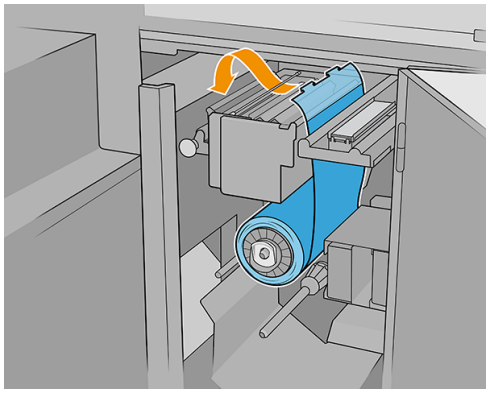
⚠ CAUTION: Slide the roll by pressing on the plastic cap or the core. Do not press on the cleaning roll itself, to avoid misalignment (telescoping) of the cleaning material.



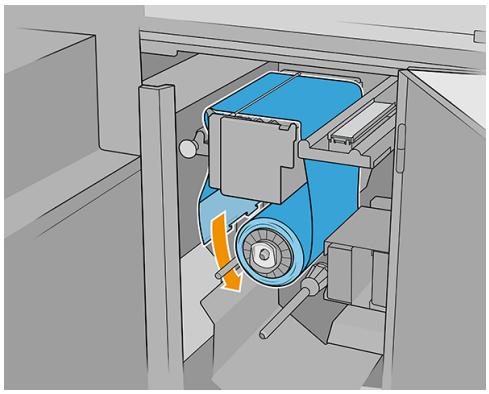
8. Insert the end cap on the upper axle, and slide it all together until you hear a click, in order to position the roll correctly.



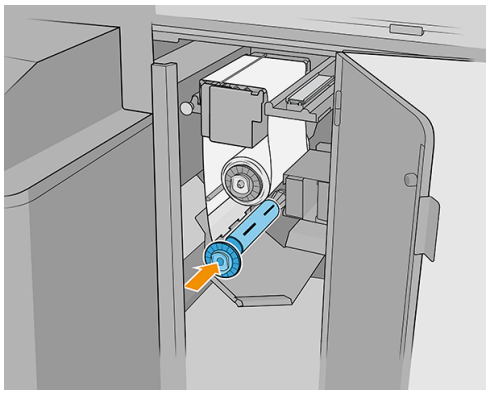
9. Pass the leading edge of the cleaning roll over the side diverters but below the central diverter, and thread the cleaning material through the pinchwheel on the left.

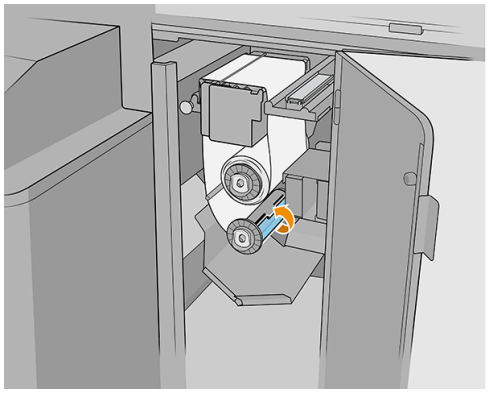


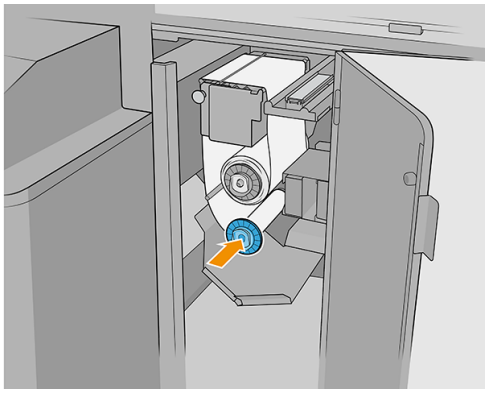
10. There is a strip of polyester film on the leading edge of the cleaning material. Insert it into the hole in the takeup core, which takes hold of it.



11. Slide the takeup core onto the lower axle.

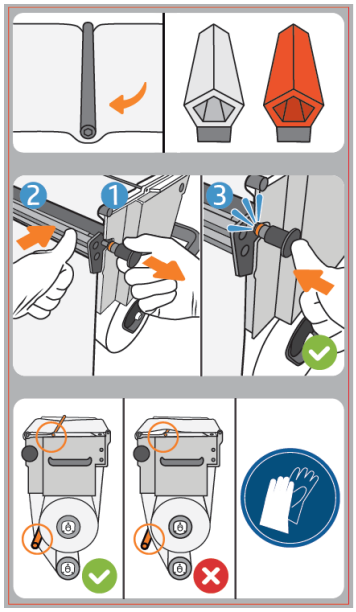


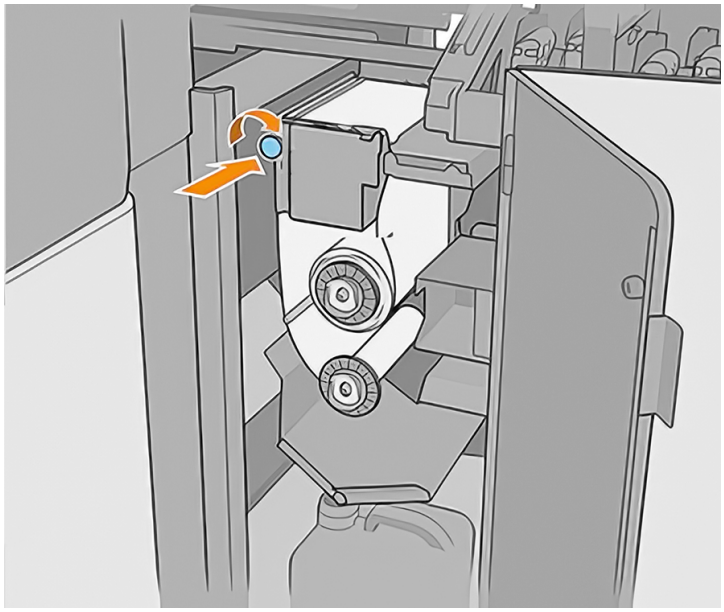




NOTE: If the cleaning roll has not been properly installed, you may see a message about clearing a printhead cleaning roll jam. Wind a little of the roll forward. The printer will check the roll again. You will need to tap **Reinitialize** to clear status errors.

12. 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, to leave the cleaning roll loose, not tight.





13. Close and lock the door.

14. Tap **Finish**.

The 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.

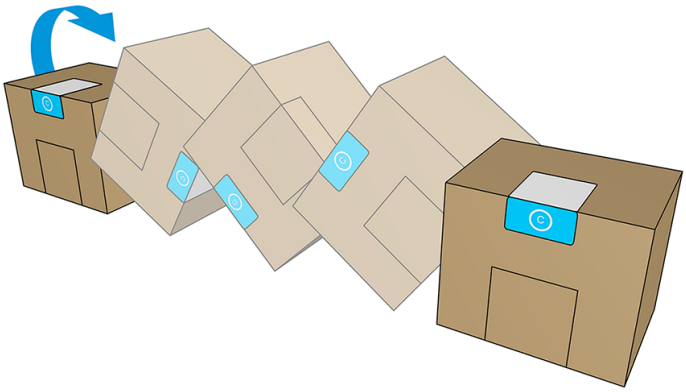
Printing with white ink (2700W and FS50 W/FS60 W only)

Printing with white ink 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 as the first layer, then a colored image is printed as the second layer, 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 as the first layer, then a solid rectangle (or irregular shape) of white ink is printed as the second layer, 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 color:** 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 each image to be seen from one side of the substrate.

The FS50 W/FS60 W printer contains a white ink cartridge, consisting of a single cardboard box containing two bags. Turn the cartridge 60 times, rotating it through a total of 360 degrees, to ensure that the ink is well mixed before use.



IMPORTANT: Before installing a white-ink cartridge, tilt it backwards and forwards 60 times.

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 to avoid printhead damage, 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 12 months from the date of manufacture, or 6 months from the date of installation.

NOTE: White ink has a tendency to settle over time.

Change printer configuration

You can change the printer configuration to use color, white underflood, or white overflood.

https://lkc.hp.com/blog/how-enable-and-disable-white-ink-system-your-hp-latex-2700w-printer

The physical differences between the three configurations are shown below.



Color configuration

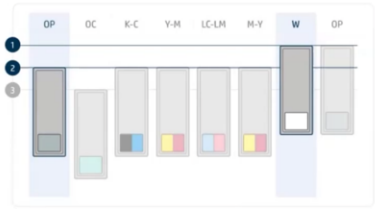


White underflood



White overflood/spot/ sandwich

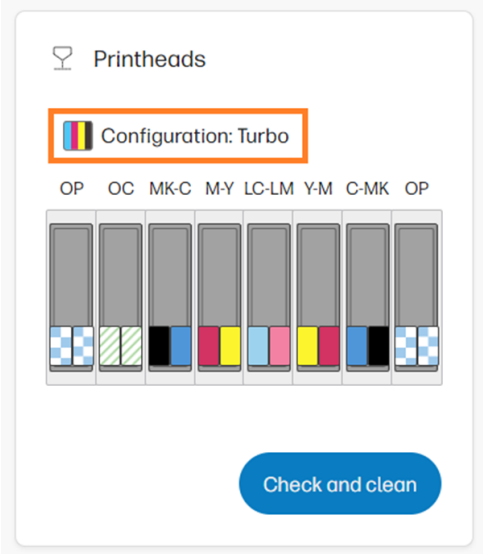




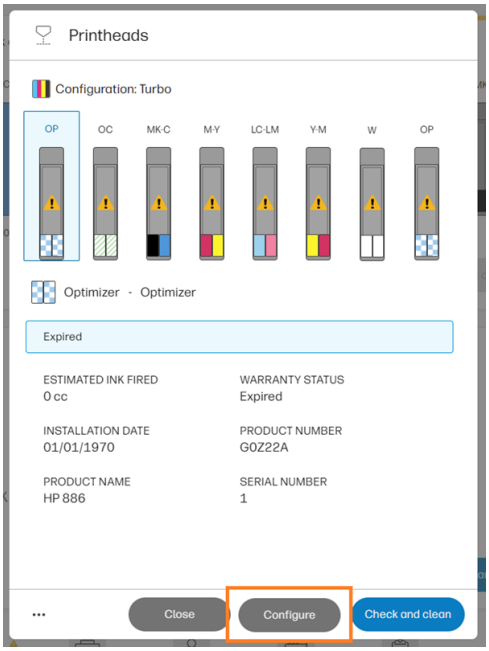


You will be guided through the configuration change by the Internal Print Server, which uses internal sensors to detect the status of the printer, and will not move on to the next step until the current step has been completed.

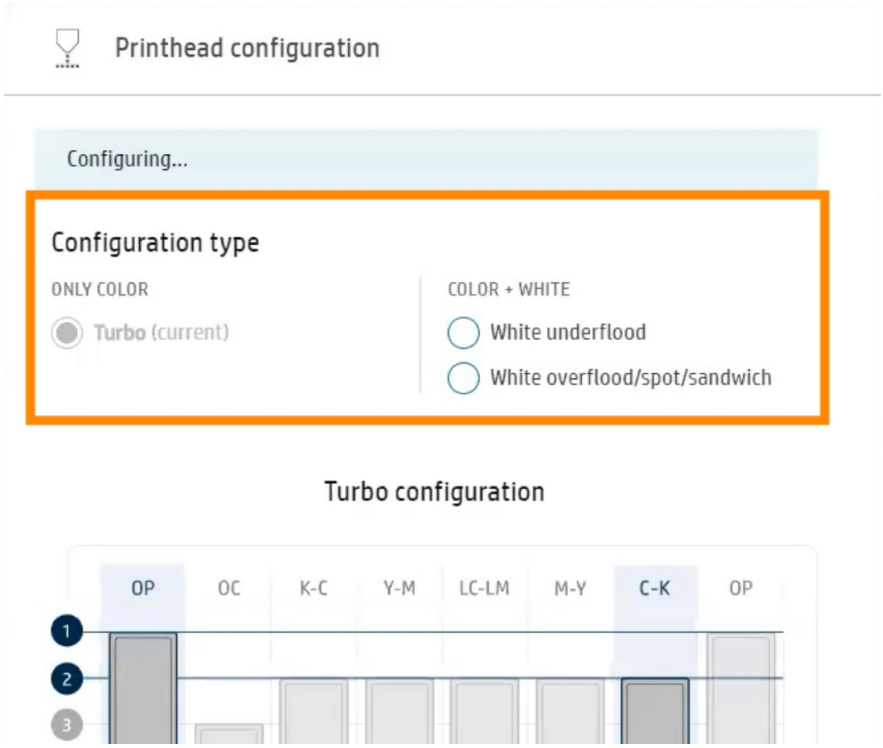
On the home screen of the Internal Print Server, the Printheads section shows the current printer configuration.



Tap **Printheads**, then tap the **Configure** button.



The following screen allows you to change the configuration.

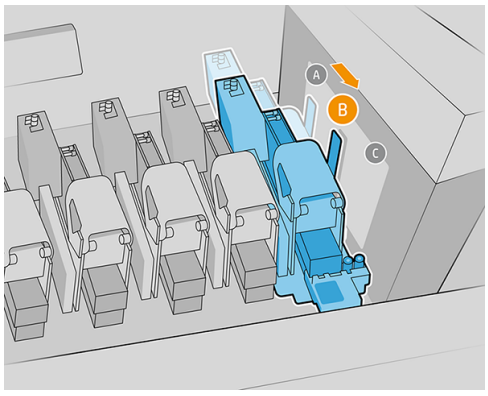


Once you have set the configuration to whatever you want, tap the **Configure** button and follow the steps indicated by the Internal Print Server.

When the process has finished, the printer will restart, and perform some checks, after which it will be ready to use.

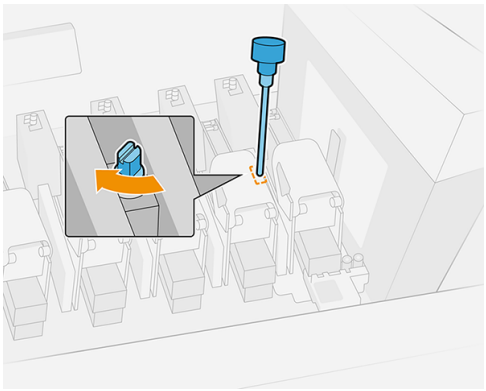
Tips

- The change can be made without following the steps indicated in the Internal Print Server. There are labels on the aerosol extractors and on the capping station to help position the printhead pockets and caps where they should be for the selected configuration. Once all changes have been made and the cover is closed, the Internal Print Server will confirm that all parts are in the correct position, and the printer will restart.

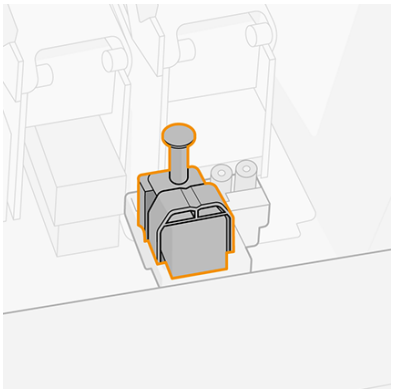


- If you have moved the movable elements to the correct places, and the printer does not detect it, it may be that one of the sensors is not working correctly. In that case, a service engineer should repair it. To avoid stopping the printer, there is a skip-step button. When you tap this button, a message warns you that an element is not in the correct position, and that the element could be damaged as a result. You can print, but any resulting damage is your own responsibility. Call a service engineer as soon as possible to repair the sensor.

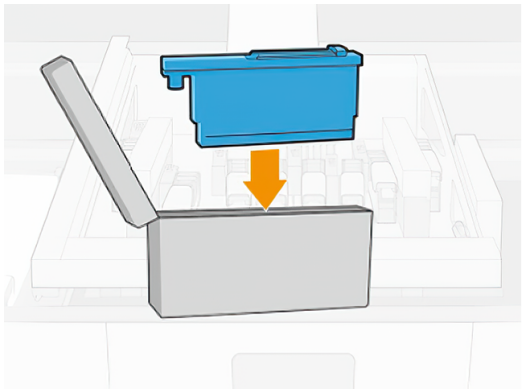
- The screw that fixes the position of the movable printhead pocket should always be tightened with the tool attached to the carriage. You should tighten the screw until you hear the tool click. The positioning screw is shown below.

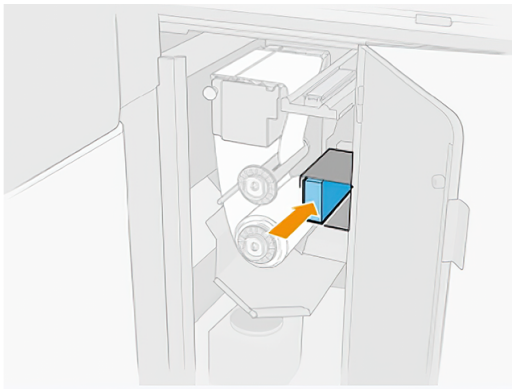


- The cap is used to allow the recirculation of white ink. If the cap is not correctly inserted, the printer will detect it after restarting and a warning will appear.



- The white printhead should be removed and stored when it will not be used for long periods of time (during the night or at the weekend). If you are printing with white configuration and the next day you want to print with white again, you should remove the white printhead and put it on the rotating wheel. The cap should be put on the white FI tower to allow the recirculation of white ink. It is not necessary to reinsert the CK printhead. When you want to insert the white printhead again, take the cap off and insert the white printhead. After this procedure, run the printhead replacement routine.

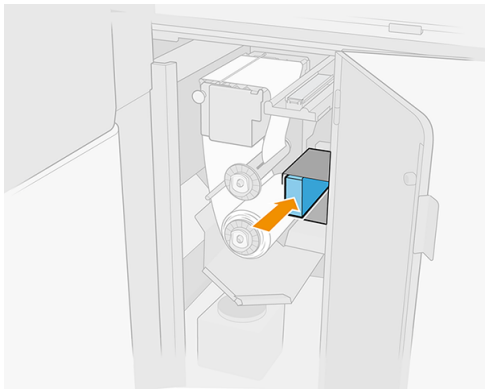




White printhead storage system

The white printhead storage system allows you to extend the life of white printheads when they are not being used.

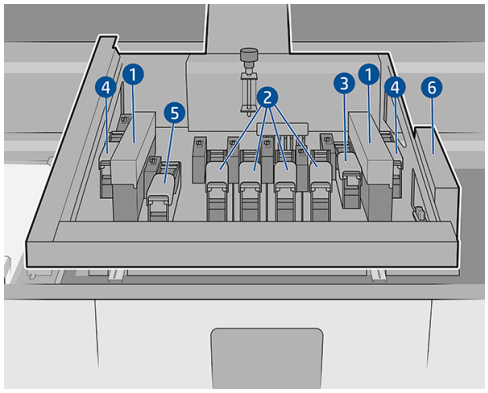
IMPORTANT: When white-ink printheads are installed, the printer performs automatic maintenance routines periodically to ensure that they function correctly.



IMPORTANT: If you do not intend to use white ink, you should remove the white printheads and store them in the storage system. Otherwise some white ink will be wasted during routine maintenance.

1. Ensure that the printer is not trying to print: stop the print queue.
2. At the control panel, tap **Replace** in the Printheads section.
3. Remove the white printhead (numbered 3 below) from the carriage.

CAUTION: Place a cloth below the printhead to prevent ink droplets from falling on the carriage.

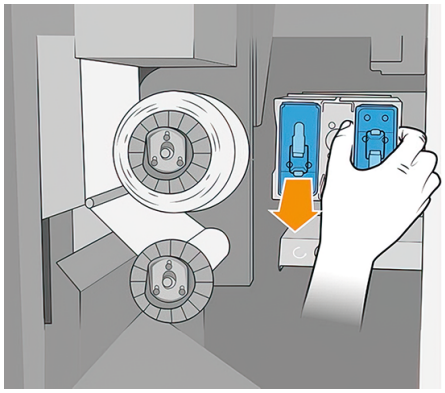


4. Check the bottoms of the white printheads. If you see some ink (which can happen because of the automatic recirculation), clean them gently with a soft, fiber-free cloth and de-ionized or distilled water.

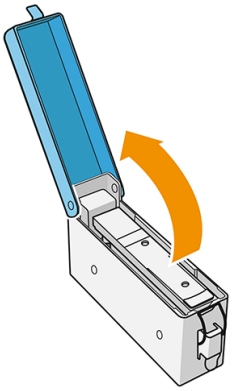
⚠ **CAUTION:** Do not use the same cloth to wipe optimizer and non-optimizer printheads. This may lead to unrecoverable nozzle defects.

NOTE: Check whether the fluid interconnect tower has a lot of ink on it. If so, clean it with a lint-free cloth before inserting the printhead.

5. Remove the printhead storage box from the storage system.



6. Open the storage box.



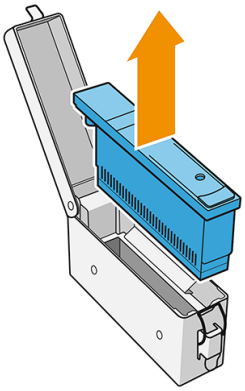
7. Check the bottom plate of each white printhead. If there is some ink on it (which can happen because of the automatic recirculation), clean it gently with a soft, fiber-free cloth dampened with de-ionized or distilled water.

⚠ **CAUTION:** Do not use the same cloth to wipe optimizer and non-optimizer printheads. This may lead to unrecoverable nozzle defects.

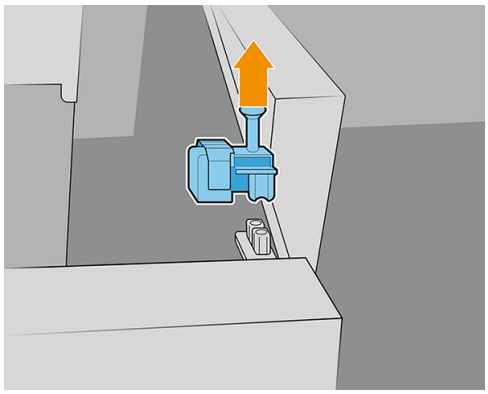
8. Regularly check the plastic needles in the printhead carriage slot, which protect the printheads. If necessary, clean them with distilled water, then dry them before installing the printhead.

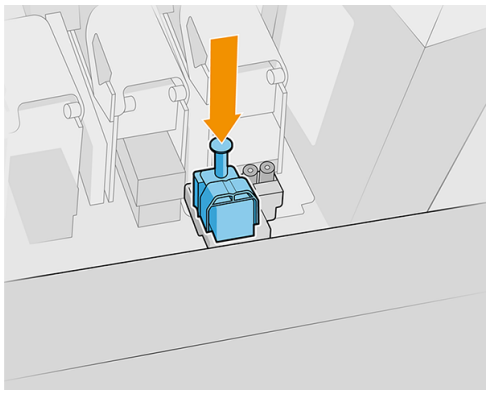
⚠ **CAUTION:** Printheads should be kept either in the carriage slot or in the storage system, otherwise nozzles and needles may become clogged.

9. Put the white printhead into the storage box, then put the storage box back into the storage system.



10. Remove the white cap from the storage station on the carriage and place it on the white-ink FI tower to permit ink recirculation.





IMPORTANT: If any component of the white module 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.

You can leave the white printheads in the storage system for as long as you like.

To use them again, reverse the above procedure.

IMPORTANT: The FS50 W/FS60 W printer should never be turned off: use sleep mode instead.

Automatic white-ink maintenance cannot occur when the printer is completely turned off; and the white-ink printheads cannot survive for more than 8 hours without maintenance.

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 **spot**: a name that the printer will recognize.

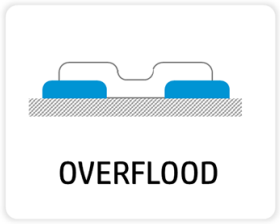
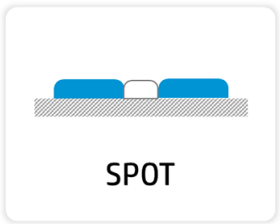
When the image is ready, send it to the RIP.

If your file does not have a layer named **spot**, you can add a white layer from 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.

Table 8-3 **Selectable options and their effects**

Option	Effect
	**Overflood:** White ink is printed on the substrate, enabling you to print color on top of a non-white or translucent substrate.
	**Underflood:** 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.
	**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.

White-ink best practices

These best practices will help maximize ink and maintenance-cartridge efficiency.

Ink efficiency and productivity optimization

How to make efficient use of your white ink.

- Do not insert and extract the white printheads into/from the carriage more than once a day.
- Remember to group all the white jobs of the day in one run.
- Remember to insert the two white printheads always in the same position, otherwise the replacement time may be increased.
- Use the print mode with the minimum number of passes that satisfies your print-quality requirements.
- Use as much of the printer's width as possible for every job and nesting composition. You can save printing time and ink this way, because printing along the biggest side will minimize the number of passes necessary to complete the print.
- Use the warm-up button (available in the RIP) as recommended.

Printhead maintenance

How to maintain your white printheads for best performance.

- The printer should remain powered on at all times.
- Always follow the correct printhead replacement procedure in the printer. Failing to do so will affect printhead life and may void the white printhead warranty.
- Keep maintenance tasks up to date. The white printhead is the most sensitive of the printhead types, so it will be the first to suffer if the printer is not properly maintained.
- Leave the white printhead in the wheel at night and when it is not going to be used. General rules depending on usage:
  - Occasional or moderate white ink usage (no more than 2 days per week):

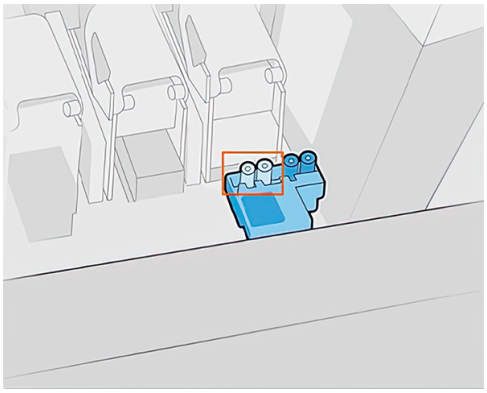
    Maintain the white printhead in the offline rotation chamber and extract it only for printing white ink. Remember to extract the printhead when there is a long color job or two or more short jobs.
  - Heavy white ink usage (3 or more days per week):

    Maintain the white printhead in the carriage. Extract it on weekends, when the printer will not be used, or when there is a long color job or two or more short jobs.

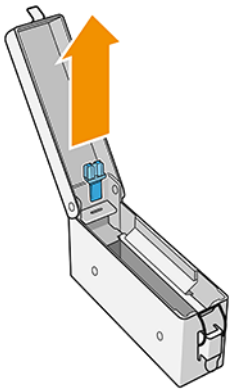
Follow these recommendations:

- Remove the printhead from the carriage carefully, placing a cloth below the needle to prevent ink droplets from falling on top of the carriage.
- Check the bottom plate of the white printhead. If there is any ink on it (which can happen because of the automatic recirculation), dampen a soft, fiber-free cloth with distilled water and let the printhead sit on it for a couple of minutes.

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



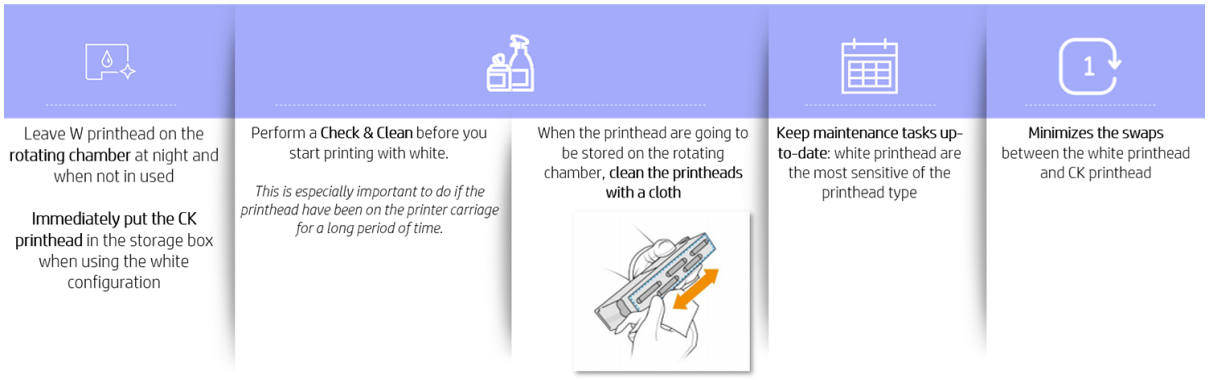
- Clean the plastic needles of the rotating chamber if they have dried ink on them.



- Always store your printhead in the same rotating chamber slot.

Auxiliary printheads should be kept in the storage station, so that they are capped, when not in the printer. If damaged, ink recirculation may be impacted, creating print-quality and/or reliability issues.

Figure 8-1 White printhead best practices



Take care of your Eco-Carton ink cartridges

Follow these recommendations to keep your white-ink cartridges in good condition.

- Do not use expired ink.

- Before inserting a new cartridge, **always** shake it 60 times according to the instructions.
- Never attempt to remove a white cartridge when the printer is performing self-maintenance.

NOTE: Self-maintenance is automatically canceled if you send a job at the same time, but it can take several minutes to complete a cancelation.

Print quality

How to maintain the quality of your prints.

- If you notice print-quality issues, print the nozzle health plot.
- If you have nozzle health issues, run a hard recovery of the affected printheads (this can be identified in the nozzle check plot). If the printhead does not recover, clean it gently with a soft, fiber-free cloth dampened with distilled water.
- Align the printheads on supported substrates.
- Check the substrate advance. If necessary, perform a substrate-advance calibration from the control panel. If the result is not between –2 and +2:

  1. Check the window of the substrate-advance sensor.
     - If the window is dirty, clean it on both sides with a lint-free cloth dampened with distilled water or a general-purpose industrial cleaner, remove any remaining moisture with a dry cloth, then run a substrate-advance calibration.
     - If the window is clean, reload the substrate and check again.
  2. Rerun the substrate-advance calibration. If you get the same result again, set the advance to the default value for the substrate you are using.

For more information, see https://lkc.hp.com/.

Removable overcoat printhead

Your printer offers the flexibility to print without the Overcoat printhead, which applies a protective coating to enhance scratch resistance but is incompatible with lamination.

For users who regularly laminate their prints, removing the Overcoat printhead can be advantageous, as it prevents the unnecessary use of the overcoat fluid. However, it is crucial to note that removing the printhead at any time is not advisable. To avoid shortening the printhead's lifespan, it should only be removed when it has been idle for at least an hour and a half, ensuring it is cool and thus preventing degradation.

For users who consistently laminate their work, this feature can provide significant cost savings by eliminating the need for overcoat fluid. However, proper planning is essential to ensure optimal printhead maintenance. Users should always allow the printhead to cool down sufficiently before removal, and frequent removal and reinsertion, especially when the printhead is hot, should be avoided to maintain its longevity

9 Printer calibration

The printer can be calibrated in various ways to maintain the best print quality.

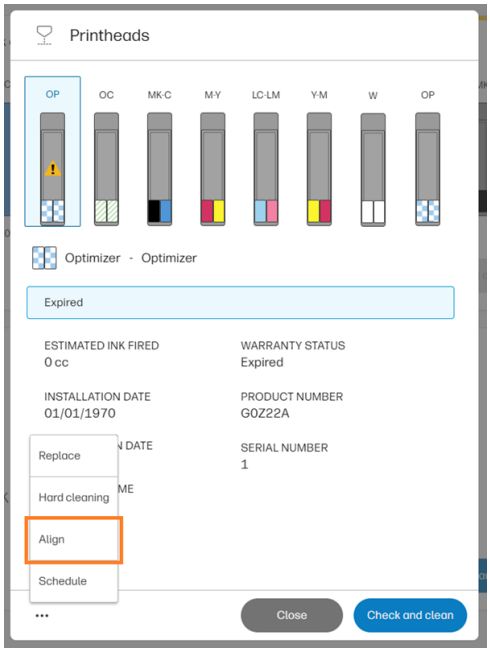
Align the printheads

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 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.



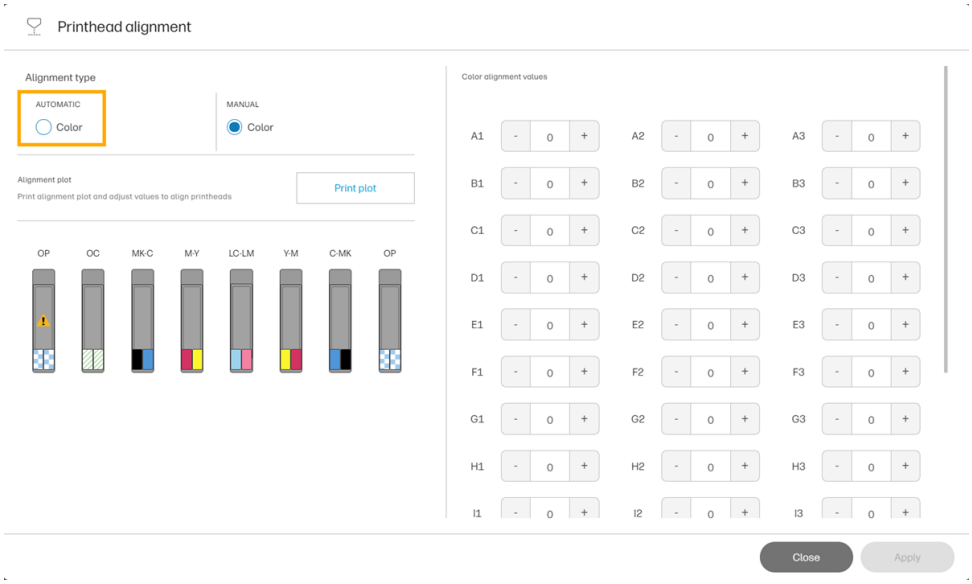
Printhead alignment can be affected by wrinkles or other substrate deformations in the print zone. If the alignment plot shows unstable results, try advancing the substrate to avoid substrate that was already cured, and may have deformation problems.

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 10 minutes. It is an unattended process, and uses printed substrate with dimensions 61 cm wide by 10 cm high (24 by 4 in). To launch, go to the Internal Print Server and tap **Printheads** > **Align** > **Automatic** > **Print alignment plot**.



The picture below shows the two printed patterns:

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

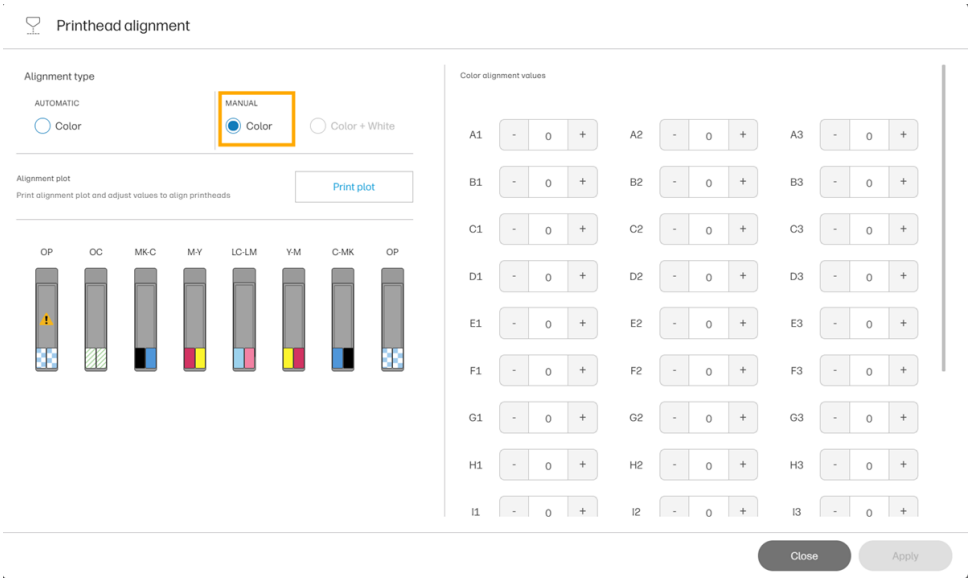


Manual alignment procedure

This procedure requires your manual intervention.

Alignment includes both the color printheads and the overcoat/pretreatment printheads. It consumes a strip of printed substrate about 62 cm (24.4 in) wide and 9 cm (3.5 in) long.

1. In the printhead alignment widget, tap **Color** under the MANUAL heading.



2. To launch manual alignment, tap **Print plot** under the **Alignment plot** heading.

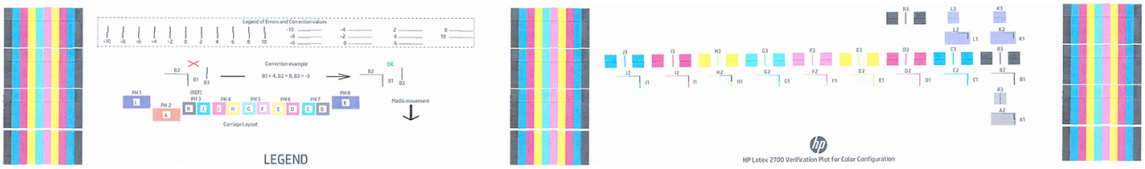
   The printer prints a plot such as the one shown below. It contains various different areas. On the left there are the patterns that are used to align. Concretely, there are three corrections for each colorant, which are X1, X2, X3; where X is the code of the colorant. X1 and X2 are used to correct printhead-to-printhead misalignments, while X3 is used to correct bidirectional misalignment.

   On the right of the plot there is, first of all, the carriage layout, which relates the codes present in the patterns to the printheads they correct. For instance, the patterns that start with A correct the misalignments on printhead 2.

   Below it there is an example of how this plot can be used to align.

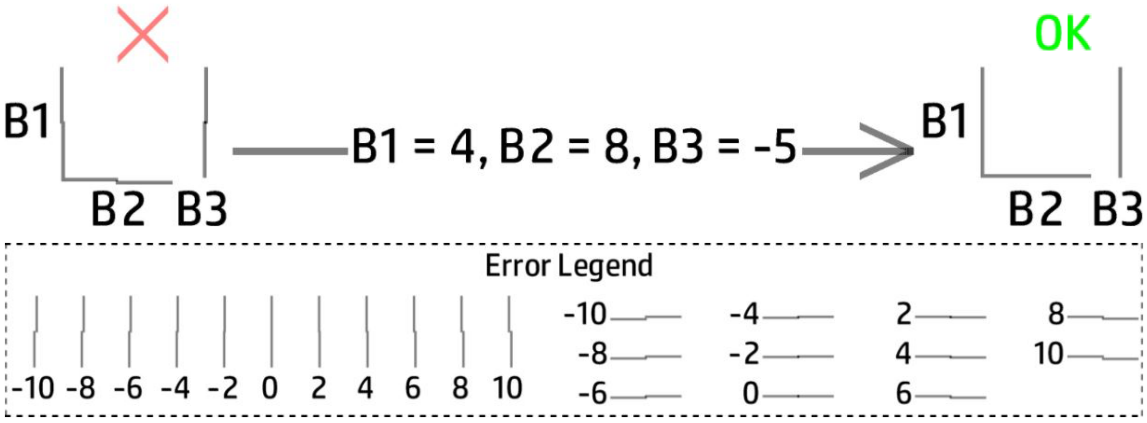
   Finally, at the bottom right of the plot, there is the error and corrections legend, which reveals the magnitude and direction of different errors you may encounter in the patterns, and the corrections you should apply in the Internal Print Server.

Figure 9-1 Printhead-alignment verification plot



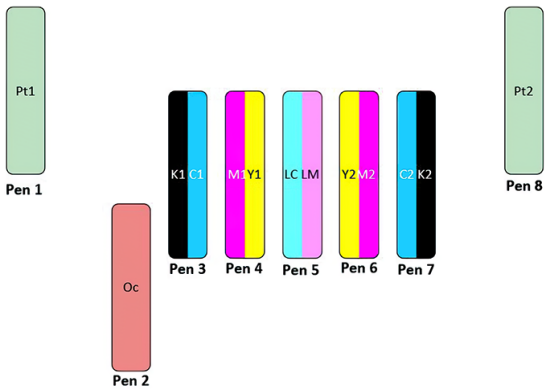
3. The printer prints X series of patterns, each one named with a letter (A–L and R). In order to align with this plot we must achieve straight lines without discontinuities in all the patterns. For instance, if we look at the left of the example below we can observe that none of the lines in the patterns are straight. In order to correct them, we have to look at the legend, which tells us which correction we

have to apply to each pattern. If we apply these corrections we then get aligned patterns as shown at the right of the example.



NOTE: This plot is always printed with the most recent alignment patterns, and thus, if the printer is perfectly aligned, all the patterns will have straight lines. Once some alignment values have changed, we recommend printing this plot to check its correctness. If this plot is not perfectly aligned, you can refine it iteratively with the procedure explained above.

The diagram below shows the distribution of printheads in the carriage.



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

The following table summarizes the correction type controlled by each pattern, and the relationship between printheads and patterns.

Table 9-1 Correction types

Pattern	Affected printheads	Correction type
A1	Oc	Scan axis
A2	Oc	Substrate axis
A3	Oc	Scan axis, bidirectional 55 ips
B1	K1/K2	Scan axis
B2	K1/K2	Substrate axis
B3	K2	Scan axis, bidirectional 55 ips
C1	C1/C2	Scan axis

Table 9-1 Correction types (continued)

Pattern	Affected printheads	Correction type
C2	C1/C2	Substrate axis
C3	C2	Scan axis, bidirectional 55 ips
D1	M1/M2	Scan axis
D2	M1/M2	Substrate axis
D3	M2	Scan axis, bidirectional 55 ips
E1	Y1/Y2	Scan axis
E2	Y1/Y2	Substrate axis
E3	Y2	Scan axis, bidirectional 55 ips
F1	M1/LM	Scan axis
F2	M1/LM	Substrate axis
F3	LM	Scan axis, bidirectional 55 ips
G1	C1/LC	Scan axis
G2	C1/LC	Substrate axis
G3	LC	Scan axis, bidirectional 55 ips
H1	K1/Y1	Scan axis
H2	K1/Y1	Substrate axis
H3	Y1	Scan axis, bidirectional 55 ips
I1	K1/M1	Scan axis
I2	K1/M1	Substrate axis
I3	M1	Scan axis, bidirectional 55 ips
J1	K1/C1	Scan axis
J2	K1/C1	Substrate axis
J3	C1	Scan axis, bidirectional 55 ips
K1	K1/Pt1	Scan axis
K2	K1/Pt1	Substrate axis
K3	Pt1	Scan axis, bidirectional 55 ips
L1	K1/Pt2	Scan axis
L2	K1/Pt2	Substrate axis
L3	Pt2	Scan axis, bidirectional 55 ips
R3	K1	Scan axis, bidirectional 55 ips

The same applies to the manual printhead alignment found in the white-ink carriage configurations. The only change is that patterns B and C will be used to align the white printhead instead of black (K2) and cyan (C2). Keep in mind that the placement in the plot of patterns Pt1, B, and C may change because of the physical change in position across the substrate axis. Also, note that even if the carriage

configuration is changed, if the printhead remains the same, the correction will still be valid. This means that you can align any of the printheads (except C2/K2 and White, which are interchangeable) in any of the carriage configurations and the corrections will be carried on.

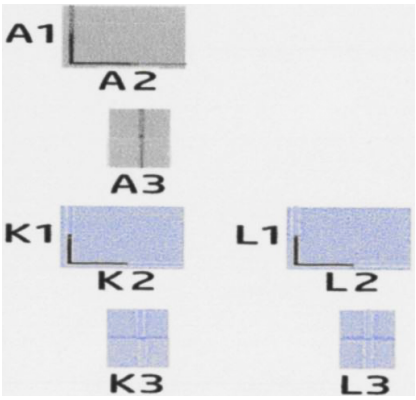
The reference for the alignment of all other printheads is K1 (printhead 3). If that printhead is changed, all the patterns should be checked. On the contrary, if any other printhead is changed, only the patterns involving the colorants of that printhead should be checked.

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 K1, K2, K3, L1, L2, and L3 are intended to align the optimizer printhead to the colored printheads, and the patterns A1, A2, and A3 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

In some cases you may experience difficulty in carrying out the printhead alignment procedure.

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, such as a self-adhesive vinyl (recommended).
- Insert a provisional correction (0), 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 297).

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 106.

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 136), and to make sure the substrate is advancing correctly (see Substrate-advance compensation on page 145), 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).

Backlit substrates cannot be color-calibrated (they are not opaque).

NOTE: Color calibration is enabled when the carriage is configured for colored inks only. White-ink carriage configurations cannot launch color calibration.

To start color calibration from the Internal Print Server, tap the Substrate Library icon  in the app bar, and select the substrate you want to calibrate from the list on the left—which must have been previously cloned, because generic substrates cannot be calibrated. Once you can see your substrate in the center of the screen, tap the ellipsis icon , then **Edit** > **Set color reference/Calibrate**, 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 314.
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 substrate settings (such as extra fluid amounts), changing environmental conditions, and so on.

Calibration status

- **Color reference not set** status indicates that this substrate has never been calibrated, and therefore no reference state is defined.



- **Calibrated** status indicates that a color calibration has been performed successfully on this substrate, the reference state is defined and still up to date.



- **Not calibrated** 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 tap the Ellipsis icon ..., then **Delete 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 FS50/FS60 series printers

It is possible to print consistent colors on different HP Latex FS50/FS60 series printers by exporting a calibrated substrate preset from one calibrated printer to another.

This process ensures that both printers use the same color references.

For more information about substrate presets, see Substrate presets on page 73.

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 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 substrate-advance sensor and is calibrated to advance correctly with most of the substrates that appear in the Internal Print Server. When the substrate is loaded, the substrate-advance sensor checks the substrate and decides whether it can be adjusted automatically or not. If not, the automatic adjustment is disabled.

If the substrate cannot be adjusted automatically by the substrate-advance sensor and the substrate advance is not correct, you may wish to change the substrate-advance compensation manually. See Troubleshoot print-quality issues on page 288 for steps to determine whether substrate-advance compensation will help you. In general, substrate-advance calibration is recommended when you see print-quality problems related to substrate advance, or when you define a new substrate.

NOTE: Manual substrate-advance compensation is available only when the manual advance mode is selected in the Internal Print Server, within **Substrate details**.

The substrate-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 check it by using the advance plot in the Internal Print Server, whether you are in automatic or manual advance compensation mode. If the advance is correct, do not change the configuration; otherwise, change the advance compensation to manual mode and follow the process described in Manual substrate-advance compensation on page 145.

Manual substrate-advance compensation

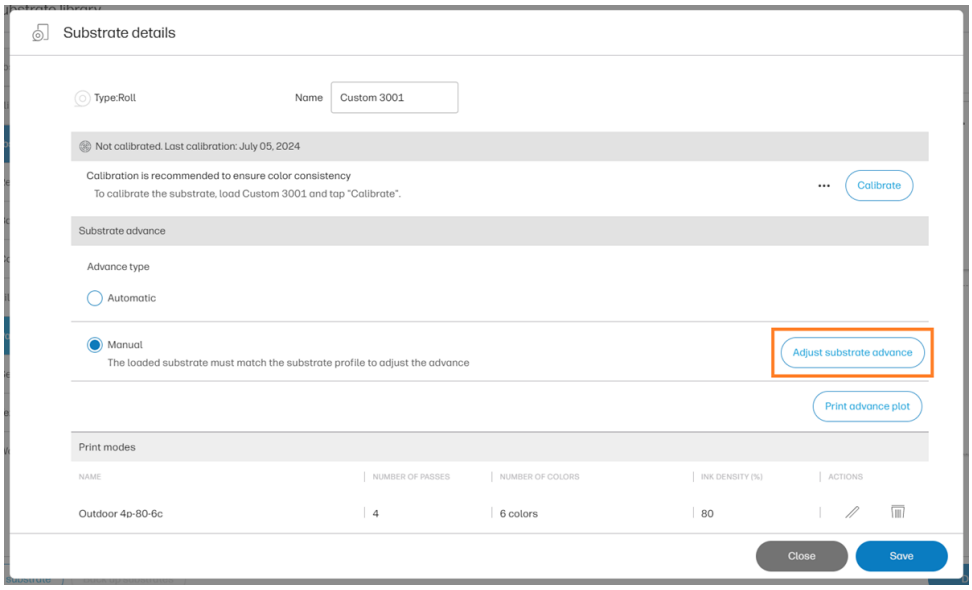
When printing with manual substrate advance, the printer will use default settings. If you want to improve these settings, you can fine-tune the substrate advance for a particular substrate type.

The following steps describe the process to adjust the manual substrate advance using the Internal Print Server. This process is available only for a non-generic substrate preset; if you are using a generic preset, you can clone it and use the resulting new preset instead (see Edit a substrate preset on page 86.).

NOTE: These steps are the same for single- and dual-roll printing.

1. Ensure that the printheads are correctly aligned.

2. Tap the **Adjust substrate advance** button that you will find under **Substrate details**.



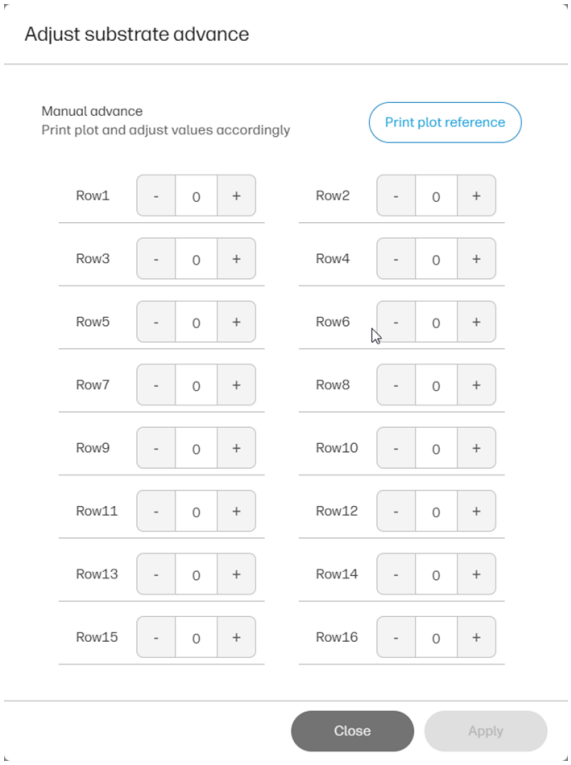
3. The printer prints a special numbered pattern that help you to apply the correct substrate-advance adjustment. Locate the pattern in the center of the substrate.



4. Look for the lightest column in each row: this is the correct value.

NOTE: If two columns seem equally light, use the average of the two values. For example, if the lightest columns are +2 and +3, use the value +2.5.

5. Enter the value for each row into the window that appears in the Internal Print Server. Check that all values are correct, then tap **Apply**.



IMPORTANT: The manual substrate-advance compensation obtained through this process should be used only with the loaded substrate type and on this printer. If you want to use the same substrate type with another printer, you need to go through the same process on the other printer.

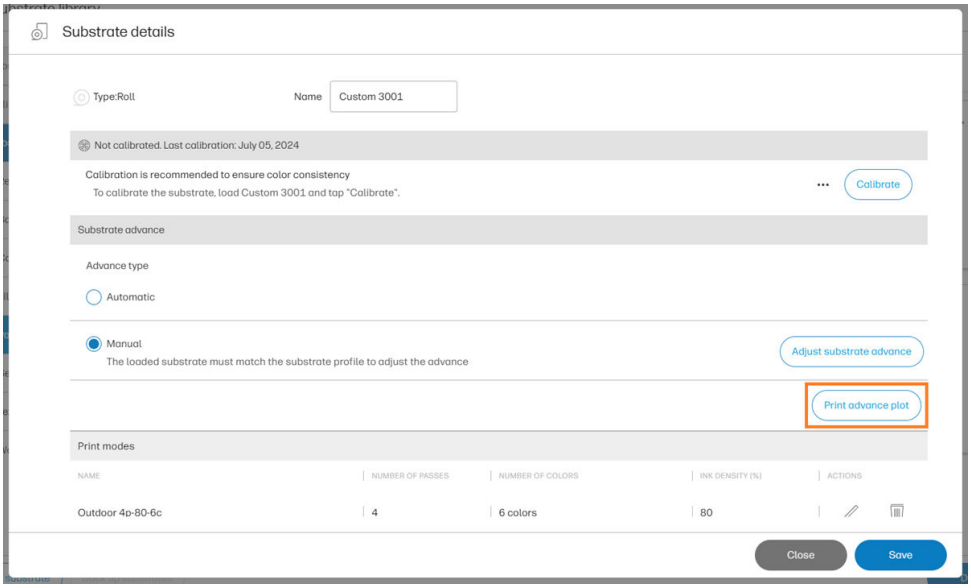
Substrate-advance verification

You can use the advance plot to check that your current substrate-advance settings are working properly to give you the best print quality on the loaded substrate with the selected substrate preset.

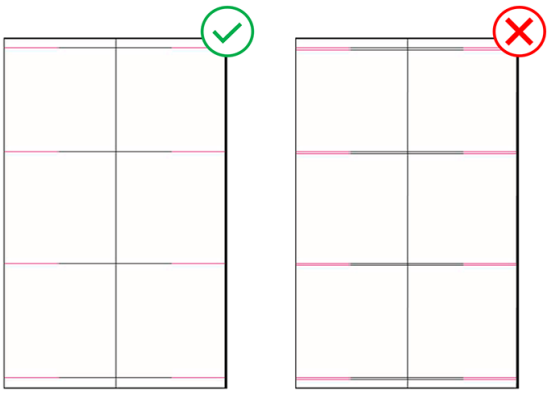
You can check the substrate advance in this way whether you have selected automatic or manual substrate advance.

Before starting, ensure that the printer is prepared for printing: substrate-advance sensor clean, printheads aligned and in good condition, enough substrate loaded, and so on.

In the Internal Print Server, tap the **Print advance plot** button within **Substrate details**.



Look at the resulting plot. You should see that the horizontal crosses are thin and there are no double lines.



Automatic substrate advance

- **Good substrate advance** with thin horizontal lines

  No action needed.

- **Bad substrate advance** with double horizontal lines

  1. Clean the substrate-advance sensor, and reprint the advance plot as above.
  2. If problems persist, change to manual substrate advance (see Manual substrate-advance compensation on page 145).

Manual substrate advance

- **Good substrate advance** with thin horizontal lines

  No action needed.

- **Bad substrate advance** with double horizontal lines

Readjust the substrate advance (see Manual substrate-advance compensation on page 145).

Calibrations specific to one substrate preset

Some calibrations that the printer performs are specific to the substrate preset in use at the time the calibration was performed, and some are not. The calibrations that are specific to one substrate must be performed again if the substrate or preset is changed.

Shown below are the calibrations, showing which ones are specific to one preset and which ones are not:

- **Printhead alignment**: This is applied to all presets and print modes. Usually, when switching from one substrate to another, there is no need to realign the printheads. However, if the printhead-to-substrate spacing has changed significantly (perhaps because of a change in substrate thickness), then the printheads should be realigned.
- **Substrate-advance compensation**: This is specific to each substrate preset.
- **Color calibration**: This is specific to each substrate preset.

Recommended calibrations after particular events

This topic provides a full set of reference information for this subject.

Table 9-2 **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
Manual substrate advance	Not needed	Not needed, as long as automatic advance is working	Not needed, as long as automatic advance is working	Not needed, as long as automatic advance is working	Not needed	Recommended if relevant

10 Accessories

A wide range of accessories can be used with the printer; here you will find detailed usage and compatibility information.

For a list of part numbers and full product names, see Printer accessories and consumables on page 1.

Accessory compatibility

This table shows which accessories are compatible with each other.

Table 10-1 Compatibility table

	Substrate saver	Plain diverter	In-line slitters	Dual roll	Ink collector	Roll to free fall
Edge holders (regular)	Yes	Yes	Yes	Yes	No	Yes
Edge holders (ink collector)	Yes	Yes	Yes	Yes	Yes	Yes
Dual roll	Yes	Yes	Yes	-	Yes	No
Ink collector	Yes	Yes	Yes	Yes	-	Yes
Roll to free fall	No	Yes	Yes	No	Yes	-

Spindle

Extra spindles are available, the same as those provided with the printer.

Table 10-2 Spindle specifications

Characteristic	Specification
Applications	Single roll
Spindle weight	25 kg (55 lb)
Roll width	0.635–3.20 m (25–126 in)
Product compatibility	HP Latex 1500, HP Latex FS50/FS60 series, HP Latex 3X00 series, HP Stitch S1000

Table 10-3 Maximum roll weight depends on width

Roll width	Maximum weight
3.20 m (126 in)	300 kg (661 lb)
2.79 m (110 in)	250 kg (551 lb)
2.54 m (100 in)	190 kg (419 lb)
2.29 m (90 in)	150 kg (331 lb)
2.03 m (80 in)	125 kg (276 lb)

Table 10-3 Maximum roll weight depends on width (continued)

Roll width	Maximum weight
1.78 m (70 in)	110 kg (242 lb)
1.60 m (63 in)	100 kg (220 lb)
1.55 m (61 in) or less *	100 kg (220 lb)

* HP recommends using the jumbo dual-roll kit for roll widths of 1.55 m (61 in) or less.

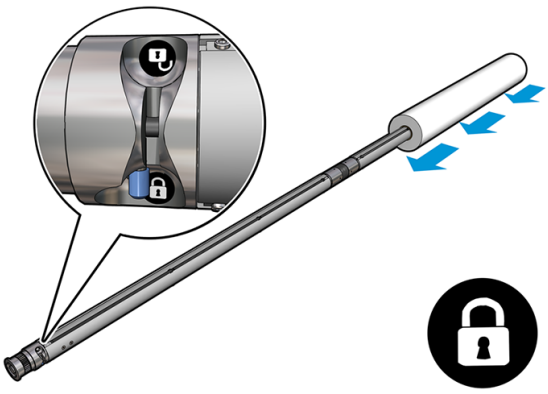
Dual-roll printing

Print on two rolls at the same time by using the dual-roll spindle.

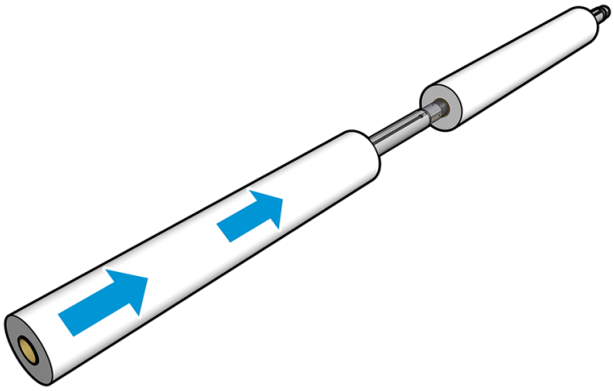
http://www.hp.com/go/Latex3000/Dual_roll_loading.

NOTE: This video applies to HP Latex 800, HP Latex 1500, HP Latex FS50/FS60 series, and HP Latex 3x00 series printers.

1. Insert the first roll on the spindle.



2. Insert the second roll on the spindle.



3. Center both rolls, using the marks on both sides of the center of the spindle. The input and output rolls should be positioned identically on their respective parts of the spindle.

4. Inflate the valves at both ends.

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

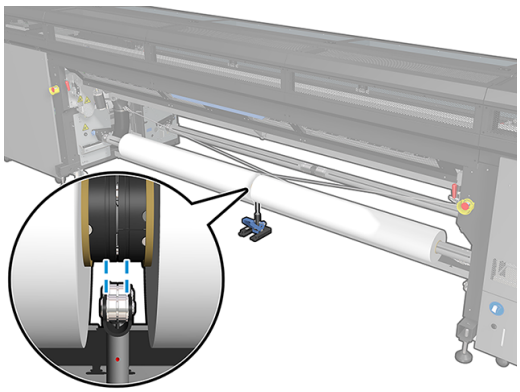
WARNING! The air gun provided with the printer is only intended to inflate the spindle. When recommended to use for cleaning purposes, make sure to do so according to local regulations since additional safety provisions may apply.

5. Place the spindle with the roll in the substrate input.

6. Place the dual-roll spindle on the printer with the long lever up.

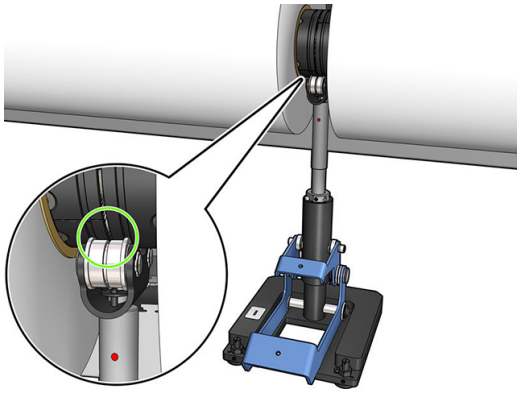
TIP: The spindle and two rolls of substrate are heavy. You are recommended to use a forklift to move it into position.

7. Position the dual-roll center support under the center of the dual-roll spindle.



8. Pull the long lever down.

   When engaging the support, make sure that the position of the support bearings corresponds to the grooves of the differential cover and that the two sets of bearings are approximately the same distance from the middle of the spindle to maximize their contact.



9. Repeat the procedure for the output dual-roll spindle.
10. You can now feed the substrates into the printer.
11. Once the substrates are in the printer, unlock the dual-roll spindle.
12. Once the substrate is aligned, automatic substrate-edge detection can be run. If this automatic process fails, or if you are using a roll width not within the dual-roll spindle specifications shown below, introduce the substrate edge values manually. Physically measure the position of the substrate edges on the dual-roll spindle ruler. The dual-roll spindle ruler, in inches and centimeters, uses positive (+) signs on one side and negative (–) signs on the other side.

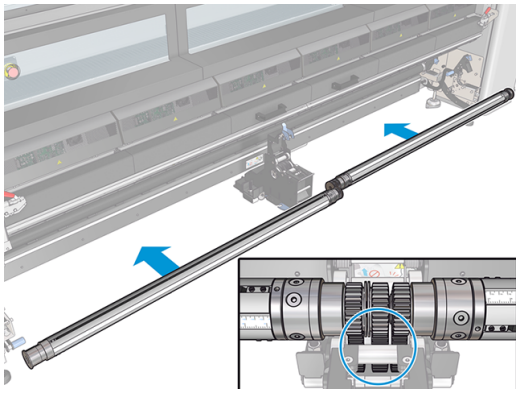
Table 10-4 Dual-roll light spindle specifications

Type:	Values:
Minimum roll width	635 mm ((25 in))
Maximum roll width	2 × 1.60 m ((2 × 63 in))
Minimum gap between rolls	40 mm ((1.6 in))
Maximum roll diameter	300 mm ((11.8 in))
Maximum total weight of both rolls	2 × 70 kg ((2 × 154 lb))

If this is the first time you use the dual-roll spindle, it has to be installed and calibrated. See the installation guide for more information.

Jumbo dual-roll kit

With the jumbo dual-roll kit, the printer can print simultaneously on two separate large rolls of substrate.



Maximum width of each roll: 1.55 m (61 in)

Maximum diameter of each roll: 400 m (15.75 in)

Maximum total weight of each roll: 200 kg (440 lb)

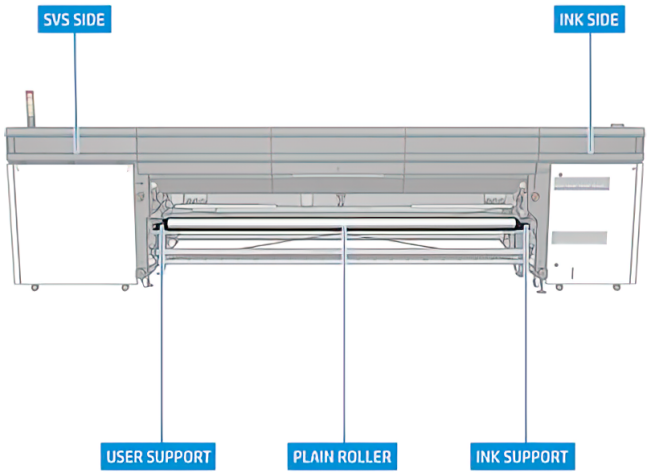
Dual-roll split spindles and quick coupling for input and output center support make it easier to load jumbo rolls of substrate; quicker and safer with one operator.

The following items are included in the kit:

- Four semi-spindles
- Substrate-input center support
- Substrate-output center support
- Two anchor kits
- Four extra feet
- Plain diverter
- Two plain diverter supports
- Two plain diverter support shims

Diverter roller

The printer needs the diverter roller in order to print on particularly large (jumbo) rolls of substrate.



Substrate roll specifications

- Maximum roll width: 3.2 m (126 in)
- Maximum roll diameter: 400 mm (15.75 in)
- Maximum total roll weight: 300 kg (661 lb)

Contents of the diverter roller kit

- Plain diverter
- Two plain-diverter supports
- Two plain-diverter support shims
- HP Stitch plain diverter support
- Four extra feet

In-line slitters

In-line slitters are vertical cutters that allow you to cut the substrate in the direction of the substrate advance, and they have to be installed, one by one, on the universal mounting beam; the position on it is decided and fixed by the user.

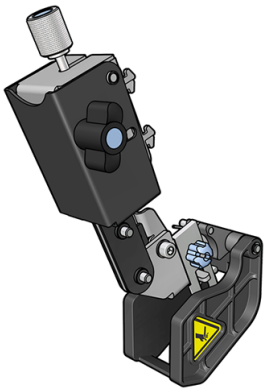
⚠ **WARNING!** Do not touch the in-line slitters when printing.

⚠ **WARNING!** Handle in-line slitters with care and store them safely.

⚠ **WARNING!** Risk of cutting your fingers! Uninstall the In-line slitters when manipulating the curing module or accessing the substrate path.

Table 10-5 Warnings

Risk of cutting your fingers.	Risk of trapped fingers	Risk of burns
		
For more safety information, see Safety precautions on page 3		



In-line slitters are an optional accessory.

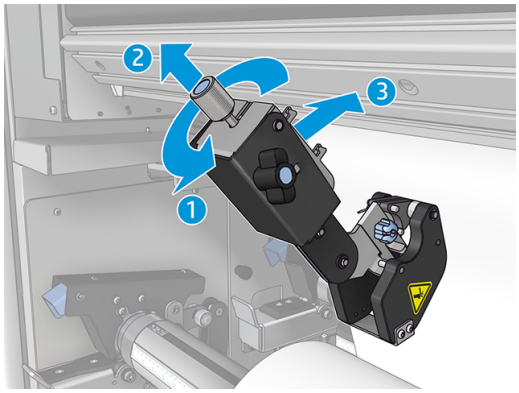
IMPORTANT: The in-line slitters can be used with a wide range of papers, but a successful cut with canvas, fabrics, and some banners is not guaranteed.

In-line slitters can be used all at the same time or individually, depending on your needs.

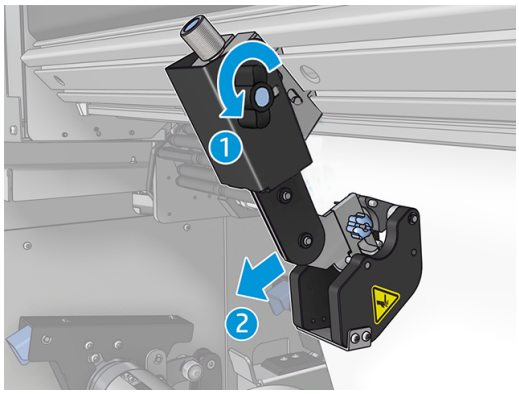


IMPORTANT: The in-line slitters can be installed onto the mounting beam when needed, but have to be placed on the cutting position once the substrate is already loaded.

To install the in-line slitters on the mounting beam the hooks have to be inserted into the mounting beam guides. To move the hooks, untighten the top blue-labeled thumb screw and pull it to help the hooks fit into the mounting beam guides.



Once the vertical cutter is placed onto the mounting beam, slide it to the desired position. Untighten the lateral thumb screw to be able to move the slitter without interfering with the substrate in case it is loaded.



Once installed, check the slitter can run through all of the universal mounting beam.

IMPORTANT: When installing the slitter pay attention to the tension applied against the substrate: too much pressure can cause the cutter to damage the diverter rollers of the platen, and too little pressure can result in cutting issues.

Once the slitter is in the desired position, tighten the top blue labeled screw to fix it.

To proceed with the cut, push the slitter until you cut the paper, then fix the position by tightening the lateral screws.

WARNING! With in-line slitters installed, special care must be taken when handling heavy substrates and when manipulating the curing module.

To uninstall the in-line slitters, reverse the process described above.

We recommend always storing the in-line slitters in the box provided if you do not wish to use them.

Substrate saver

The substrate saver protects the substrate and avoids substrate waste during loading. It improves production and efficiency, saving time and money.

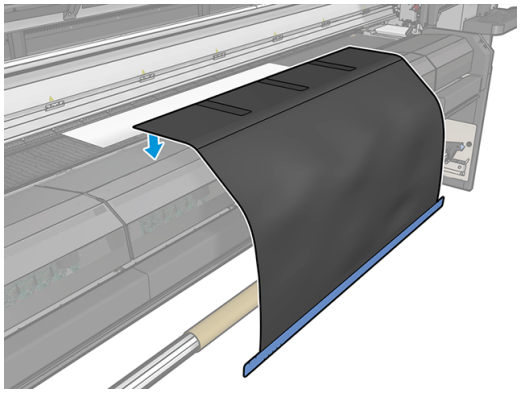
http://www.hp.com/go/latex1500/substrateloading

NOTE: This video applies to the HP Latex 1500 Printer and to the HP Latex FS50/FS60 printer series.

IMPORTANT: Before using the substrate saver; make sure the substrate is loaded, reaches the print zone, and that the loading table is closed.

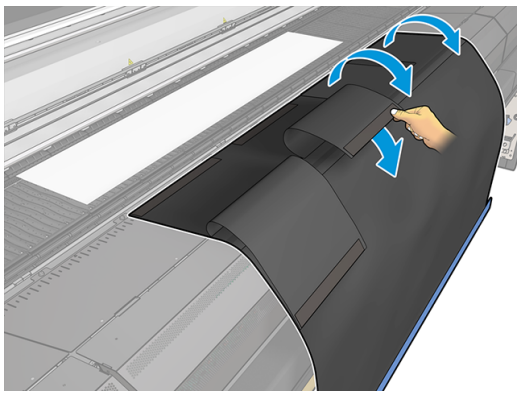
NOTE: The standard model provided with the product supports substrates from 1220 mm to 1600 mm (48 to 63 in) width. For smaller substrate widths, special solutions are available. Contact HP Support.

1. Place the substrate saver on the curing module (hold it with a single magnet in the center), and make sure it is fixed; use the three magnets under the accessory.

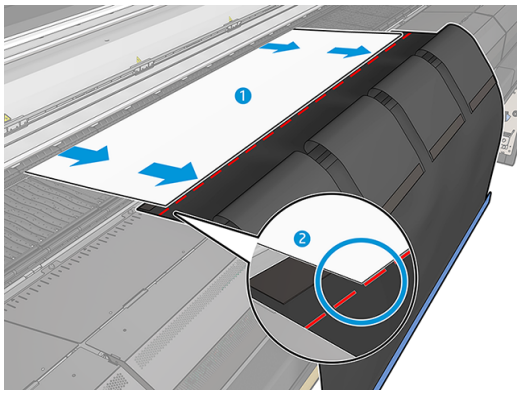


2. Use the curing top plate tool and the marks to ensure that the substrate is centered (no ruler, marks on the metallic part).

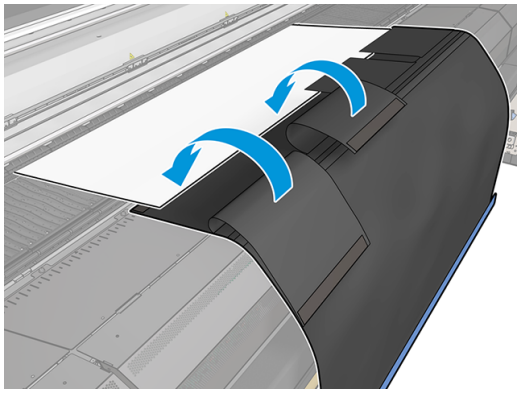
3. Open the substrate saver flaps.



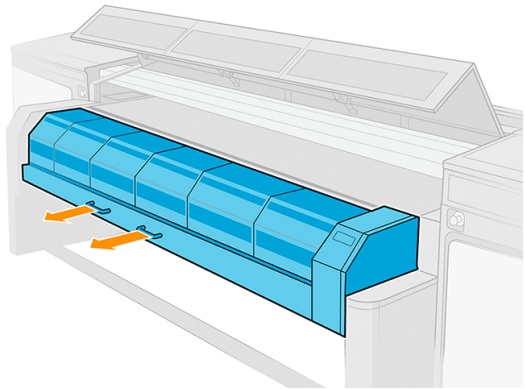
4. Advance the substrate manually or automatically but do not surpass the red line inside the flaps. Make sure to advance enough paper to reach the substrate saver.



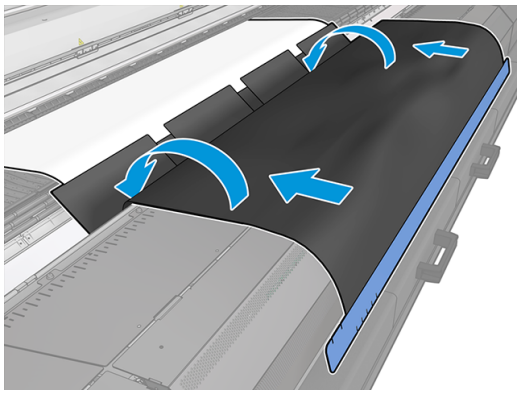
5. Grip the substrate with the substrate saver. Make sure there are no wrinkles in the substrate or the tool flaps.



6. Open the curing module.



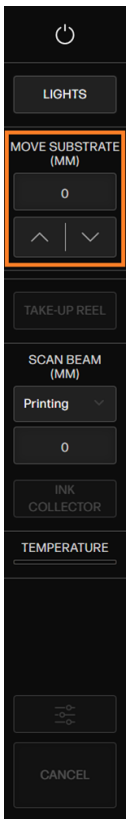
7. Push the substrate saver through the curing module.



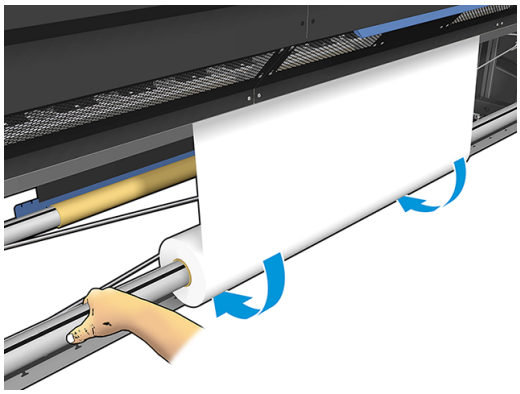
8. Go to the Internal Print Server to start the loading process. Use the move the substrate buttons manually to move the substrate backwards to detach the substrate saver magnets from the curing module and up to the platen.

IMPORTANT: To avoid damage; do not let the substrate saver reach the loading table.

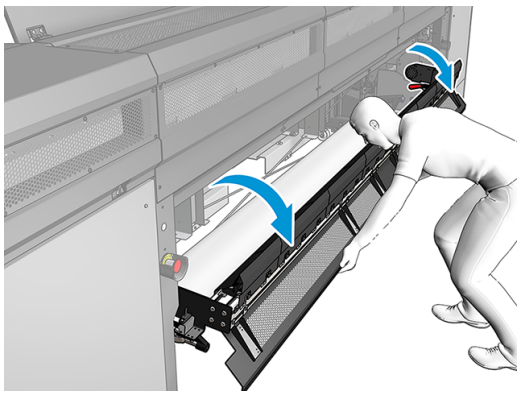
9. Rewind the substrate saver in order to position the lower side of the tool next to the core.



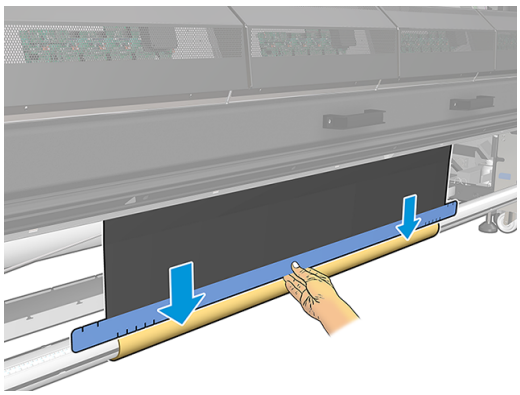
10. Turn the input spindle to tighten the substrate on the roll and avoid any sag.



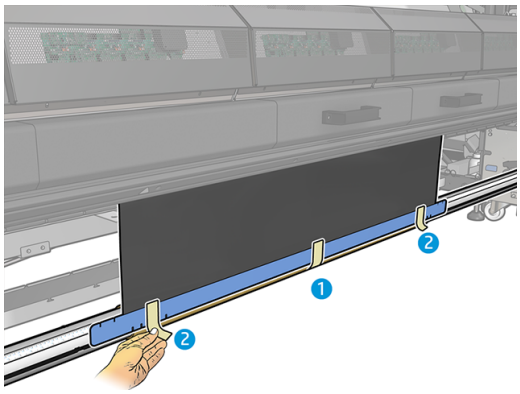
11. Open the loading table.



12. Pull the edge of the tool and center it on the core.

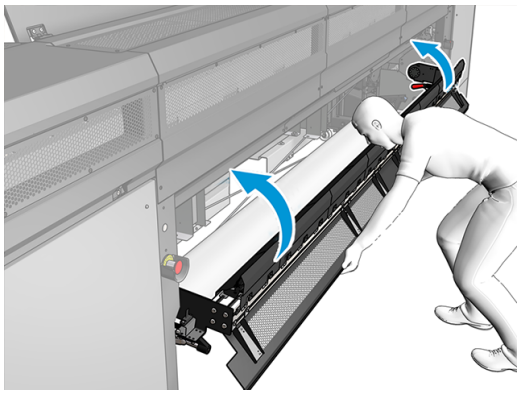


13. Attach the tool to the core with tape. Make sure to put the tape on the blue edge of the substrate saver.



14. Roll the tool on the core until the tool's upper edge lies beyond the platen.

15. Close the loading table and finish the loading process in the Internal Print Server.



NOTE: When processing a finished roll, see if the tool is inside by locating the blue edge of the saver on the core. If necessary, make use of the substrate-saver edge holders.

Ink collector

You must install the ink collector kit, available as an accessory, to protect the printer from the ink that falls through the substrate.

Use the ink collector

Use the ink collector before printing on porous substrates (textile mesh, flag, or voile). The kit should be removed before printing on non-porous substrates.

http://www.hp.com/go/latex1500/inkcollector

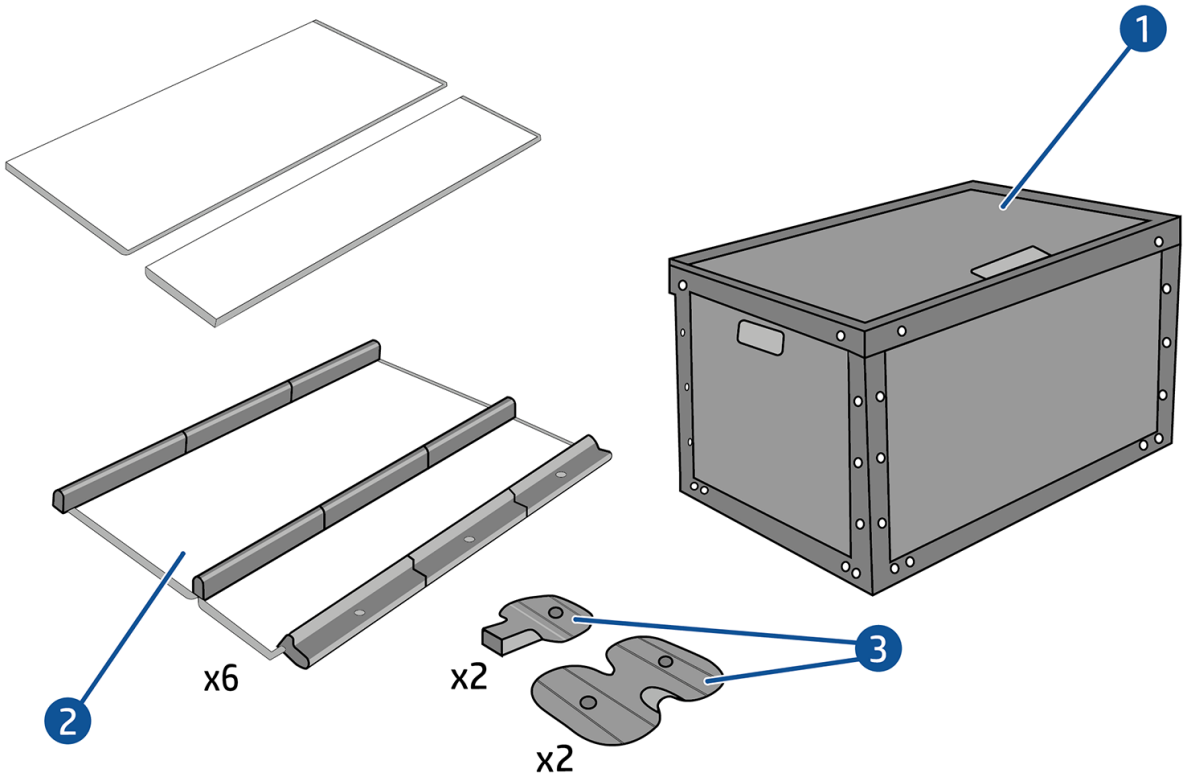
⚠ **CAUTION:** Ensure that the operating temperature of the substrate recommended by the manufacturer is not exceeded. If this information is not available, ask the manufacturer. Do not load substrates that cannot be used at an operating temperature above 125°C ((257°F)).

⚠ **CAUTION:** 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 cleaner roll, and inks) may present a risk of fire.

⚠ **CAUTION:** Do not load substrates with auto-ignition temperatures below 250°C ((482°F)). Ensure that no ignition sources are close to the substrate.

Kit components

These are the contents of the ink-collector kit.



1. Ink-collector container
2. Ink collectors with two replaceable foams

3. Ink-collector edge holders

TIP: Keep the ink-collection container to protect and store the ink-collector parts when not in use.

Recommended solution space*

Always use the default printmode settings as a starting point for your substrate. The following settings ensure proper curing and quality at nominal printing conditions for generic materials.

Table 10-6 Recommended solution space

Type:	Availability:
✓	Recommended print mode for this substrate type
✓	Alternative print mode for this substrate type.
	Available, but setting adjustment may be required. Risk of condensation and exceeding curing capacity for long jobs.

*For non-porous substrates, use the non-porous "Textile & Canvas" solution space even if the ink collector is installed.

Install the ink-collector kit

Follow these instructions to install the kit.

Table 10-7 Warning

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				

TIP: You are advised to wear gloves.



1. Ensure that the printer is not printing.
2. If any substrate is loaded, unload it. Then remove the edge holders from the substrate path.
3. Tap the **Raise carriage beam to install position** button.

4. Ensure that all windows, covers and doors are closed and remain in their original position.
5. Open the ink collector container and check that the ink collector foams are dry and clean enough to be used.

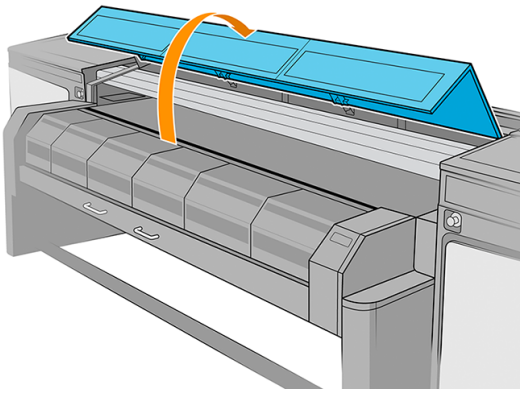
   Also check that the foams fit into the spaces provided for them. If they have expanded and no longer fit, replace them.

NOTE: Ensure that you dispose of the used foams correctly. Consult the guidelines from your local authority.

6. Go to the Internal Print Server and tap the **Install ink collector** button on the main screen.
7. Follow the instructions in the Internal Print Server to complete the installation. If you need further information, read the steps below.

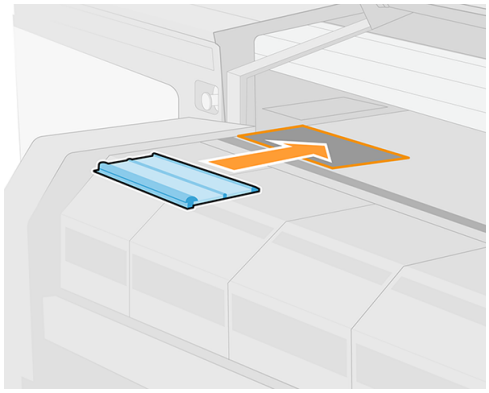
CAUTION: If you install the kit incorrectly, some parts of the printer may be damaged.

8. To facilitate module installation, we recommend raising the carriage beam to the installation position.
9. Open the window.

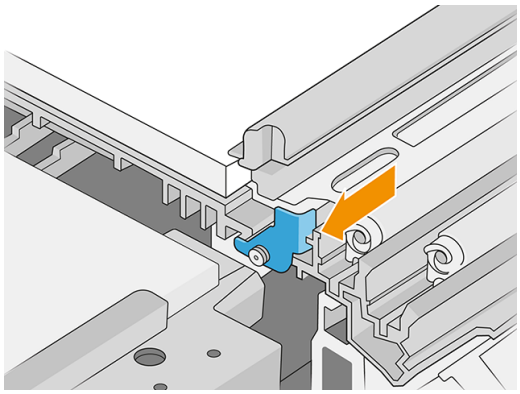


10. From the front on the left side, install the first module and insert it into the guide.

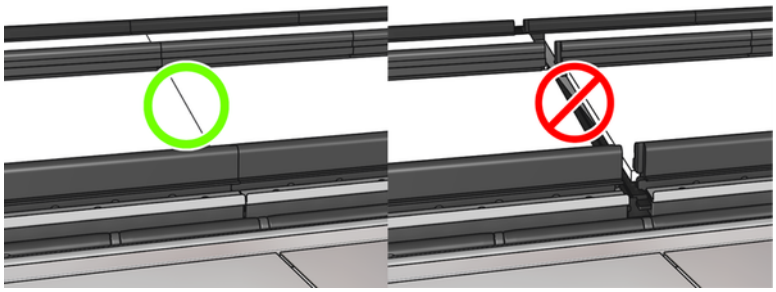
NOTE: At this point, you will have better access if you have raised the carriage beam.



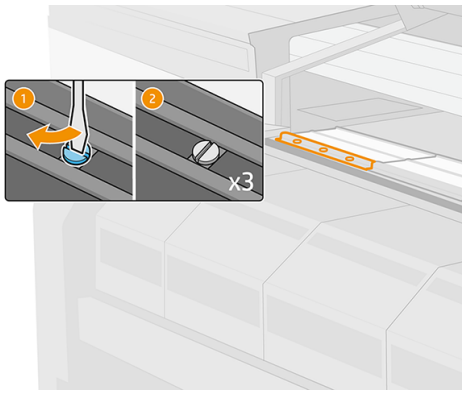
11. Slide the module to the left until it reaches the stop.



12. Insert all the ink collector modules from the left to the right.
13. Attach each one inserted to a module that is already in place.
14. Check that all the ink collector modules are aligned with each other and that there are no gaps between them.



15. Lock all modules with a quarter turn of each screw clockwise. You may need a flat screwdriver or a coin.



Uninstall the ink-collector kit

Follow these instructions to uninstall the kit.

TIP: You are advised to wear gloves.

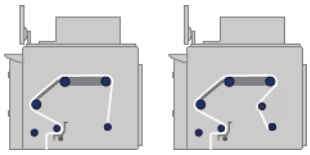


1. Unload the substrate and remove the output spindle.
2. Tap the **Raise carriage beam to install position** button.
3. Close the curing module and latches.
4. Open the three latches of each module.
5. From the front of the printer, remove each module.
6. Tap **Finish** to complete the removal process. The carriage beam moves down and the carriage moves along the platen for checking.
7. Check whether the foams need to be replaced; if so, replace them. Store them in the ink collector container, keeping the latches on top. You can also store the edge holders there.
8. Perform the maintenance operations recommended after uninstalling the kit.

Roll to free fall

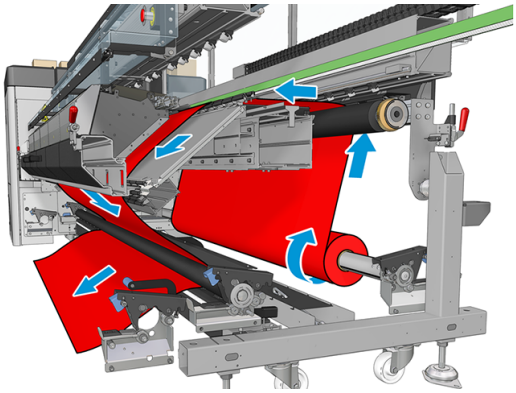
The roll-to-free-fall configuration is useful when you want to cut and remove one or more prints as soon as they come out of the printer.

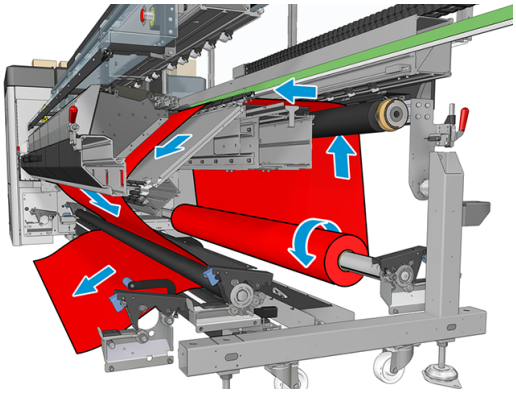
The substrate is kept under tension between the input roll and the tension roller; but it can be cut after the tension roller because then it is no longer under tension.



The substrate roll is mounted on the input spindle; the printed substrate will be deposited on the floor in front of the printer. The substrate goes from the input spindle over the main roller, over the platen, over the front diverters, and then to the tension roller, after which it continues to the floor.

You can load substrate with the printed face inwards or outwards on the spindle, in which cases the spindle will turn in opposite directions. The printer asks you for the winding direction if it cannot detect it automatically.





High Capacity ink kit

This accessory is added to the printer to use higher capacity ink cartridges (10 litres).

NOTE: This accesory is embedded in the printer and cannot be removed by the customer. However, the printer can still use 5 litres cartridges.

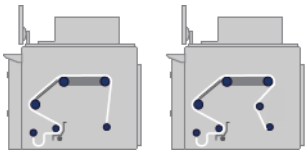
IMPORTANT: Always use original HP cartridges.

To use it, simply connect a 10 litres cartridge to its corresponding color.

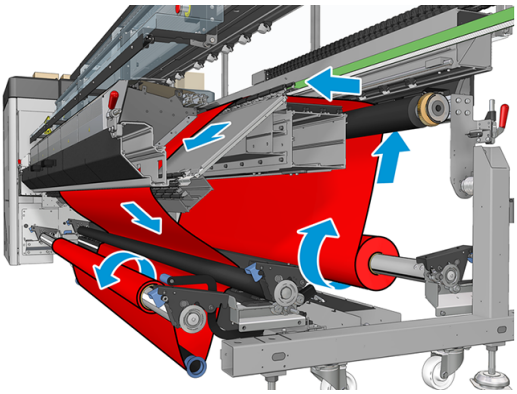
Roll to collector

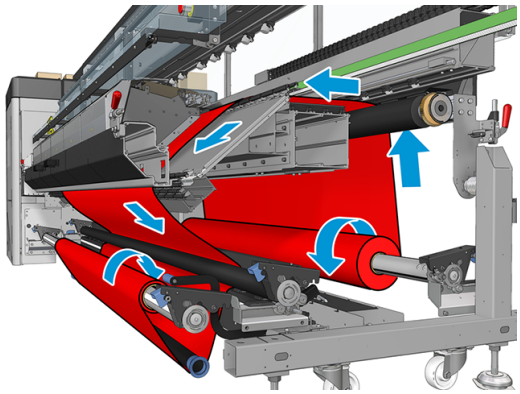
The roll-to-collector configuration is useful when you may want to cut the substrate and remove the output roll before finishing a print job that uses a particular input roll.

The substrate is kept under tension between the input roll and the tension roller; but it can be cut after the tension roller because then it is no longer under tension.



This configuration is similar to the roll-to-free-fall configuration, but with the addition of a collector roller and tension bar.





11 Hardware maintenance

The following sections provide details for this topic.

⚠ **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. No-one should be allowed to use the printer without this training.

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

You can use the user maintenance kit provided with the printer to perform all the required maintenance operations. When the supplies in the kit are exhausted, you can purchase another copy of the kit.

User cleaning kit contents (K0Q45-67270 / 4BS24A)

The user cleaning kit contains supplies that you will need to clean the printer.

Table 11-1 Supplies provided in the kit

K0Q45-67270	HP Latex R Series Cleaning Kit	Qty
8710-2813	HAND BRUSH SCRUB OVAL PVC 1 each	1 each
8710-2814	TOOL-HAND-MISC HERA R TYPE 42MM	1 each
9300-0963	GLOVES MEDIUM/ LARGE WHT NAT-RBR-LTX 50 each	50 each
9300-2543	BRUSH CLEANING	1 each
9301-6442	9301-6442 MEDIUM HEAD FOAM SWAB 163MM-L 50 each	50 each
CH971-62487	CLOTH,HI_ABSORB,LINT_FREE,9INX9IN	50 each

User maintenance kit contents (K0Q45-67270 / 4BS24A)

The user maintenance kit contains supplies that you will need to maintain the printer.

Table 11-2 Supplies provided in the kit

Part	Quantity
Cleaning brush	1
Lint-free cotton swabs	50
Plastic gloves	50
Lint-free cloths	50
Carriage-oiling felts	4
Lubricant-oil bottles	2
Grease and oil kit	1
Intermediate tanks	5
Manual-purge kit	1
Hard and soft blades	3 each
Service-station caps	8
Plastic putty knife	1

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

Maintenance tools recommended but not provided

This topic provides a full set of reference information for this subject.

Table 11-3 Maintenance tools recommended but not provided 1

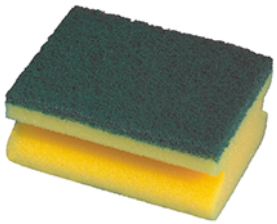
Sponge to clean the printhead cleaning pinch roller, driver, and diverter rods	Brush for cleaning dust and dried ink from components and surfaces	Lint-free cloth, for cleaning covers, sensors, and delicate parts (included in the cleaning kit, but some extra cloths may be needed)	Distilled water for general cleaning, or a general-purpose industrial cleaner (such as Simple Green) when indicated
			

Table 11-4 Maintenance tools recommended but not provided 2

Vacuum cleaner, handy or normal, with nozzle accessories	Flashlight, for general use	Folding steps, for general use	A flat screwdriver
			

Table 11-5 Maintenance tools recommended but not provided 3

Allen keys	Torx screwdriver set	Metal putty knife to remove dried ink	Spiral steel scourer to remove dried ink
			

Summary of maintenance operations

The table shows the recommended frequency of each maintenance operation.

Table 11-6 Maintenance operations for all substrates

Frequency	Maintenance operation	Cross-reference
Every day, recommended	Check and clean the printheads	
	Check and clean the service-station caps	Clean the service-station caps on page 177
	Check and clean the FI tower (FS50 W/FS60 W only)	Check and clean the FI tower on page 179
Every week	Clean the aerosol nozzle plate and filters	Clean the aerosol nozzle plate and filters on page 179
	Check and clean the printer, print zone, and output platen	Check and clean the printer, print zone, and output platen on page 183
	Clean the service station caps	Clean the service-station caps on page 177
	Check and clean the left printhead cleaning blade	Check and clean the left printhead cleaning blade on page 186
	Clean the printhead cleaning system thoroughly	Clean the printhead cleaning system thoroughly on page 188

Table 11-6 Maintenance operations for all substrates (continued)

Frequency	Maintenance operation	Cross-reference
Every month	Clean and lubricate the drop-detector rods	Clean and lubricate the drop-detector rods on page 192
	Clean the pinchwheels and drive roller	Clean the pinchwheels and drive roller on page 194
Every 0.1 M scan-axis cycles	Clean the sides of the scan-axis rods, and oil if needed	Clean the sides of the scan-axis rods, and oil if needed on page 196
Every 4 months or 600 IT cycles, whichever comes first	Replace the white intermediate tank (FS50 W/ FS60 W only)	Replace an intermediate tank on page 201
Every 4 months	Replace the white service-station cap (FS50 W/ FS60 W only)	Replace the white service-station cap (FS50 W/ FS60 W only) on page 203
	Clean the needles and caps inside the storage box (FS50 W/FS60 W only)	Clean the needles and caps inside the storage box (FS50 W/FS60 W only) on page 207
Every 6 months	Clean the drying filter (IDS side)	Clean the drying filter (IDS side) on page 209
	Clean the water-tank filter	Clean the water-tank filter on page 210
	Clean the drying-fan guards	Clean the drying-fan guards on page 212
Every 150 liters of ink	Clean the bottom of the carriage and the line sensor	Clean the bottom of the carriage and the line sensor on page 214
Every 0.35 M scan-axis cycles	Replace and calibrate the right printhead cleaning blades (FS50 W/FS60 W only)	Replace and calibrate the right printhead cleaning blades on page 226
Every 0.75 M scan-axis cycles	Replace and calibrate the right printhead cleaning blades (FS50/FS60 only)	Replace and calibrate the right printhead cleaning blades on page 226
Every 50000 printed substrate meters	Clean and grease the substrate drive transmission	Clean and grease the substrate-drive transmission gears on page 230
Every 1.5 M scan-axis cycles	Check and clean the printhead cleaning system	Check and clean the printhead cleaning system on page 231
	Clean the e-box and power-box fan filters, and the carriage cooling fan grid	Clean the e-box and power-box fan filters, and the carriage cooling fan grid on page 235
	Check and replace a service-station caps	Check and replace a service-station cap on page 261
	Replace the oiling felts	Replace the oiling felts on page 242
	Clean and lubricate the scan-axis rods	Clean and lubricate the scan-axis rods on page 248
	Clean and grease the printhead latches	Clean and grease the printhead latches on page 252
Every 2000 liters of ink	Clean the curing perforated plate and the curing fans	Clean the curing perforated plate and the curing fans on page 254
Every 3000 liters of ink	Clean and grease the printhead primers	Clean and grease the printhead primers on page 256
	Clean the FI towers (for the FS50 W/FS60 W, including the CK storage box and white printhead FI tower)	Clean the FI towers, including the CK storage box and white-printhead FI tower on page 259
Every 3 M scan-axis cycles	Replace all service-station caps	Check and replace a service-station cap on page 261

Table 11-6 Maintenance operations for all substrates (continued)

Frequency	Maintenance operation	Cross-reference
Every 1000 IT cycles	Replace the intermediate tanks	Replace an intermediate tank on page 201
Every year	Check the correct behavior of the residual current devices	Check the correct behavior of the residual current devices (RCD) on page 265
	Purge the ink from the MSS box (FS50 W/FS60 W only)	Purge the ink from the MSS box (FS50 W/FS60 W only) on page 266
When required	Check and empty the condensation collector bottle	Check and empty the condensation collector bottle on page 268

How to perform maintenance operations

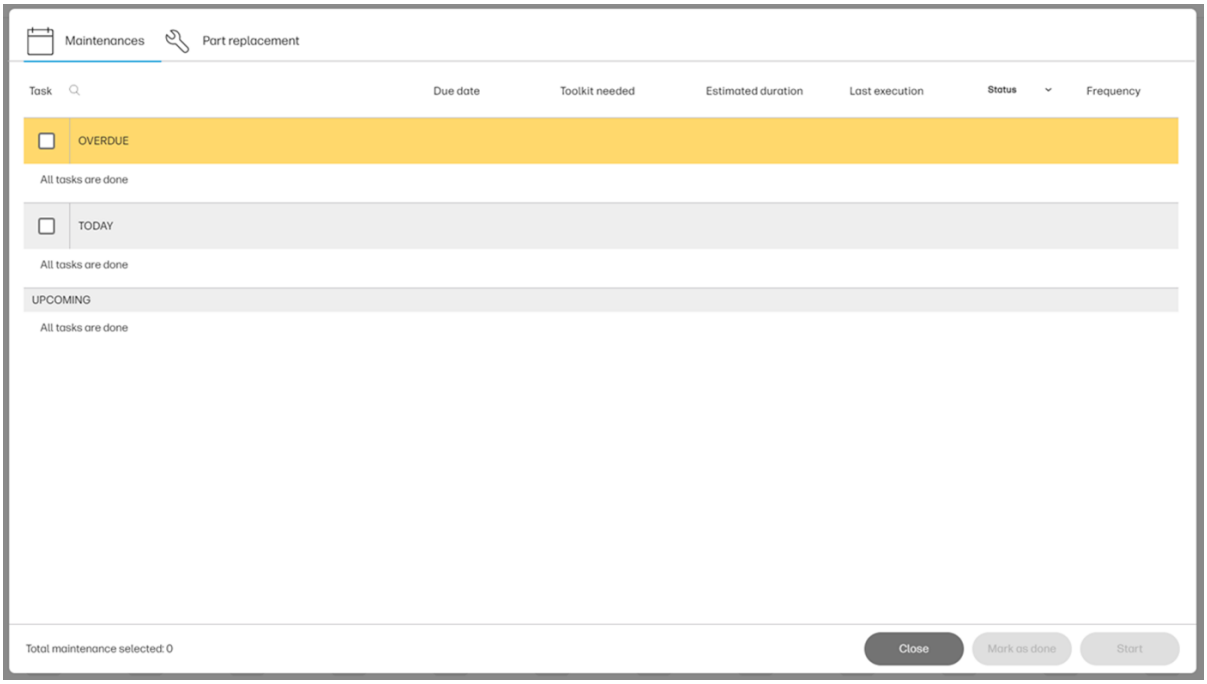
You can access maintenance information from the Internal Print Server.

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 272.

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

This topic explains the concepts involved in this subject.

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

The following sections provide details for this topic.

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

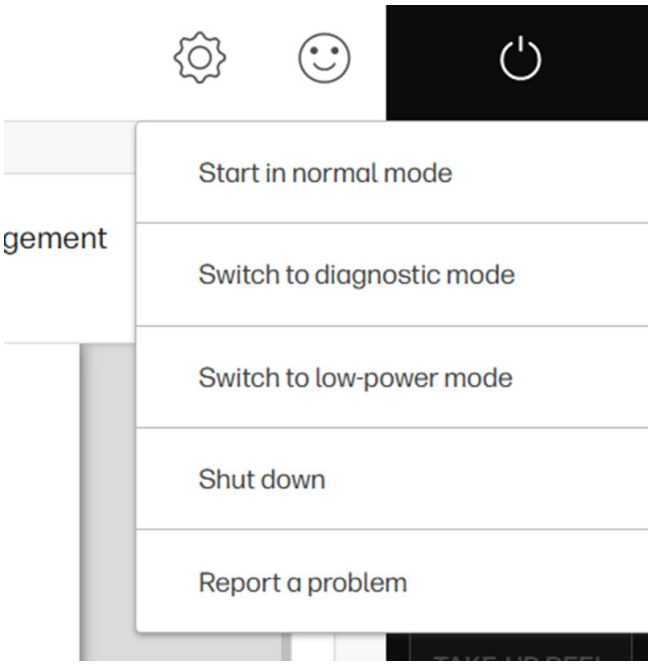
IMPORTANT: Strictly follow all the recommended steps, for safety reasons.

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

The following steps provide the complete procedure for this topic.

1. Tap the power button in the Internal Print Server, then 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 Printer and E-box switches at the front right of the printer. Do not turn off the IPS switch, unless you need to disconnect the printer completely.



⚠ 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

The following steps provide the complete procedure for this topic.

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



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

⚠ 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.

Maintenance operations

Follow these instructions whenever the periodic maintenance operations are due.

Most of the maintenance operations are explained in the Internal Print Server (tap **Maintenance**). HP recommends that you follow the maintenance instructions here in the user guide only if you do not find the operation you need in the Internal Print Server.

Before starting any maintenance operation, 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.

Table 11-7 Warning labels

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				

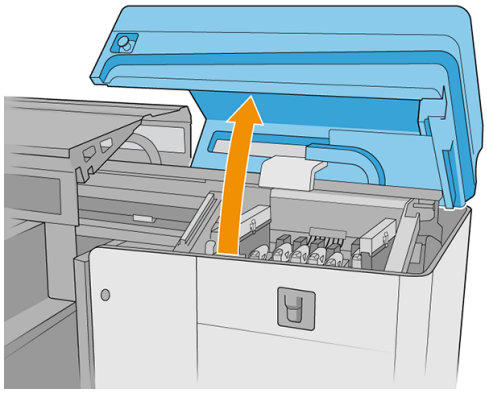
Clean the service-station caps

The following steps provide the complete procedure for this topic.

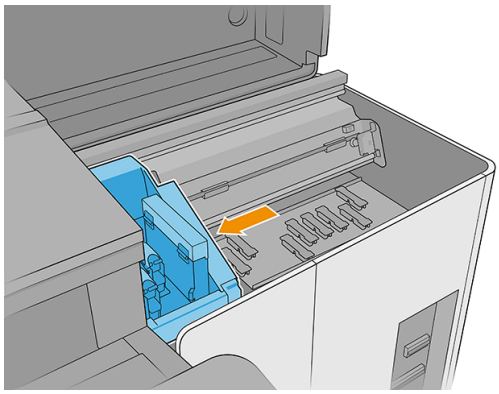
Table 11-8 Warning labels

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				

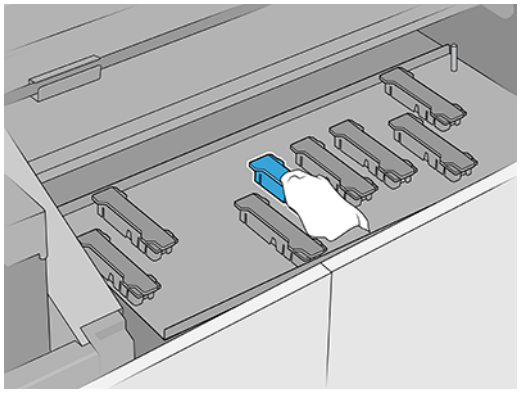
1. Open the carriage cover.



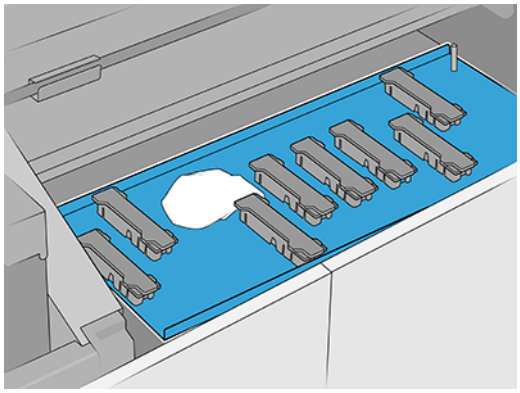
2. Move the carriage manually to the left in order to access the service station.



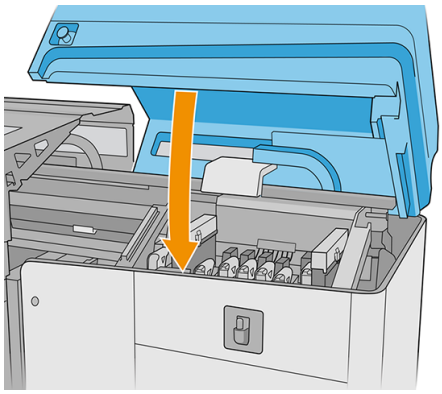
3. Check the service-station caps. If necessary, clean them with a lint-free cloth dampened with distilled water.



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

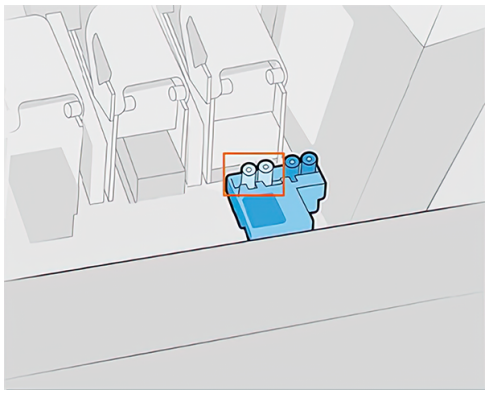


5. Close the carriage cover.



Check and clean the FI tower

The FI tower is the structure into which the printhead 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.

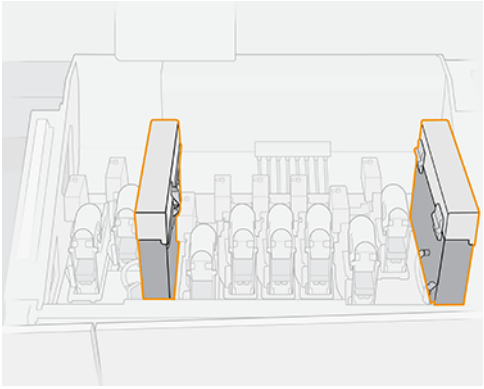
Clean the aerosol nozzle plate and filters

The following steps provide the complete procedure for this topic.

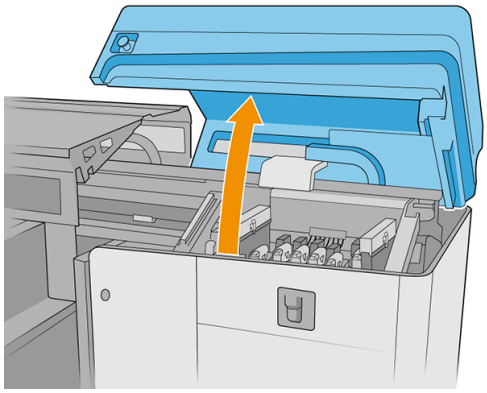
Table 11-9 Warning labels

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				

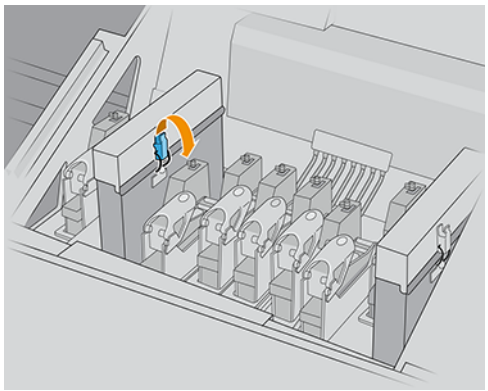
The aerosol nozzle plate and filters should be kept clean for optimal performance and reliability. In some printing conditions with high scan beam or textile materials, more aerosol is generated, which blocks the aerosol-removal-system nozzle or filter.



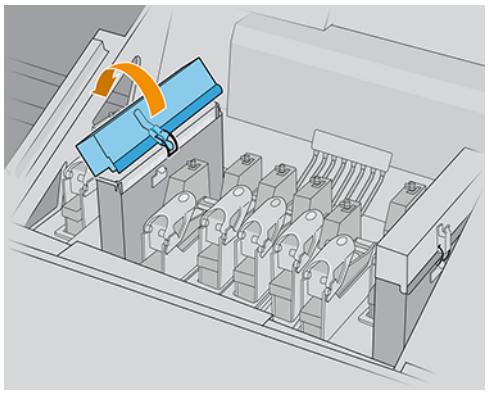
1. Open the carriage cover.



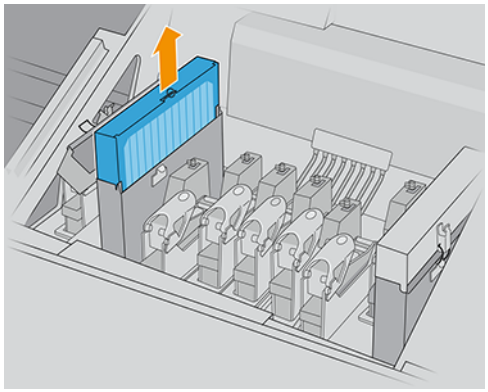
2. Open one latch on the right side of each aerosol filter module.



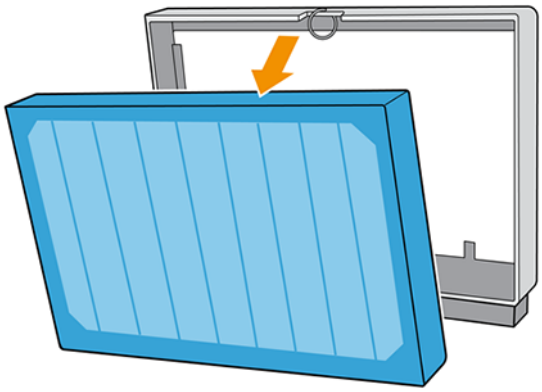
3. Open the lid of each filter.



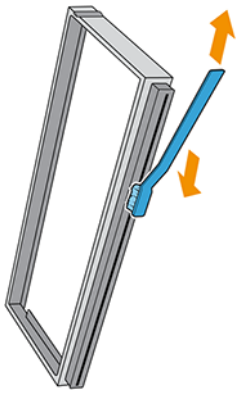
4. Remove both aerosol filter frames, using their handles.



5. Remove the filters from their frames.

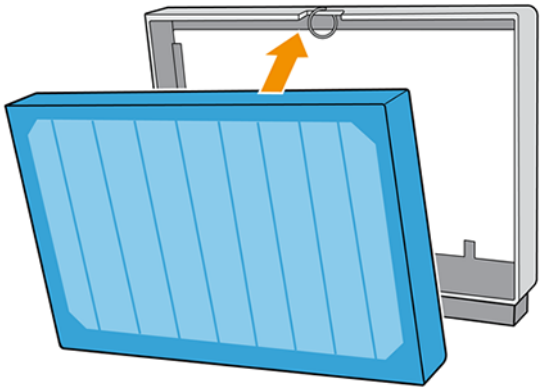


6. Use a flat screwdriver to remove the dry aerosol and then a brush to remove any remaining dirt from the filter frame. Try to avoid loose dirt falling into the frame.

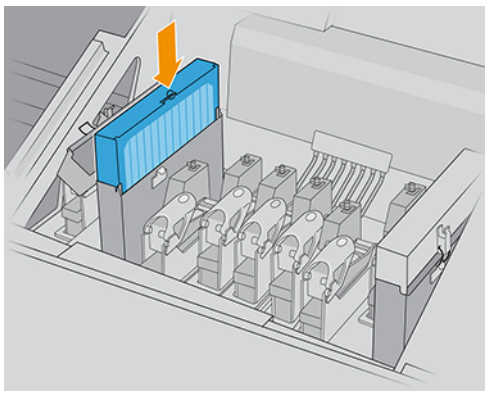


7. Put both filters back into their frames.

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

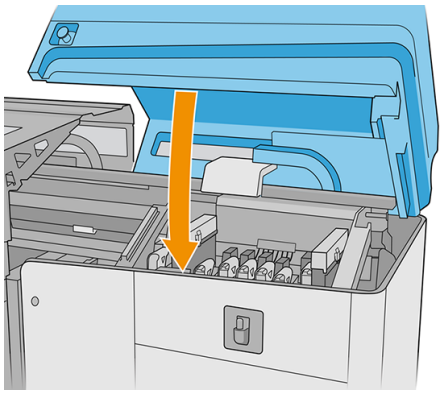


8. Reinsert both filter frames into the printer. There is only one way to insert them that works. If you feel resistance, try to insert the filter the other way round.



9. Close the lids.
10. Close the latches.

11. Close the carriage cover.



Check and clean the printer, print zone, and output platen

The following sections provide details for this topic.

Table 11-10 Warning labels

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

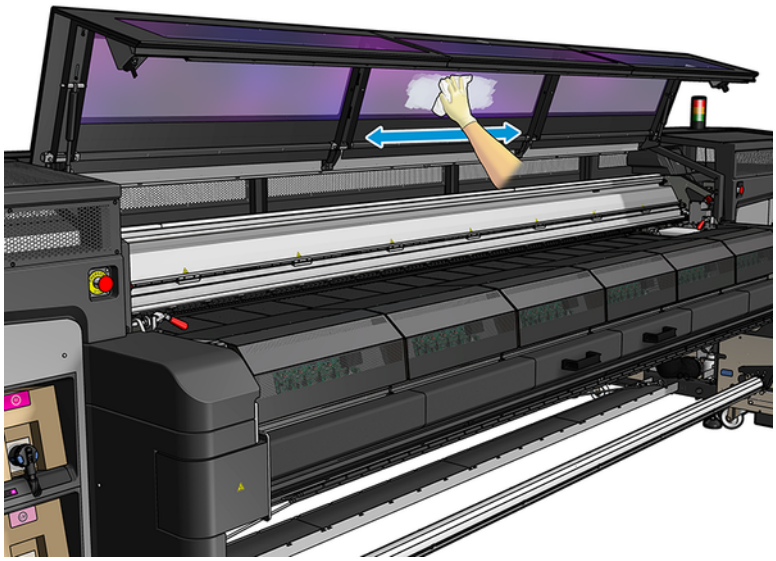
For more safety information, see Safety precautions on page 3

Check and clean the printer

Some cleaning operations are on demand depending on your print duty cycle, substrates or print modes used, and environment.

1. Check the printer for dust and aerosol on the covers, windows, computer screen, and so on.

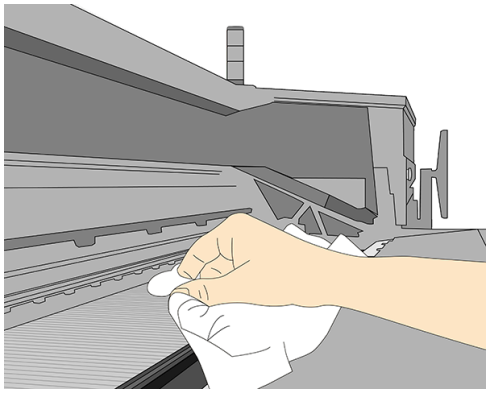
2. If condensation is seen on the inside of the window over the middle of the printer, wipe it with a dry cloth. Use folding steps to reach the inside of the window.



Clean the output platen

The platen should be cleaned whenever it is visibly dirty, or when you notice marks on the back of the substrate.

1. Clean the platen with a clean cloth dampened with distilled water. Be very careful not to touch the printheads.
2. Check the print zone and remove any dirt, aerosol, or ink from the platen. Check and clean the substrate paths, focusing on the bottom-plate zone. Check the print output areas for ink drops, aerosol, or condensation.



3. If the vacuum is not sufficient, make sure the vacuum holes are not obstructed with dirt.

TIP: You can clean the holes by blowing on them with an air gun.

CAUTION: The air gun provided with the printer is intended only for inflating the spindle. If you use it for cleaning purposes, make sure to do so according to local regulations, as additional safety precautions may be needed.

See also General cleaning instructions on page 4.

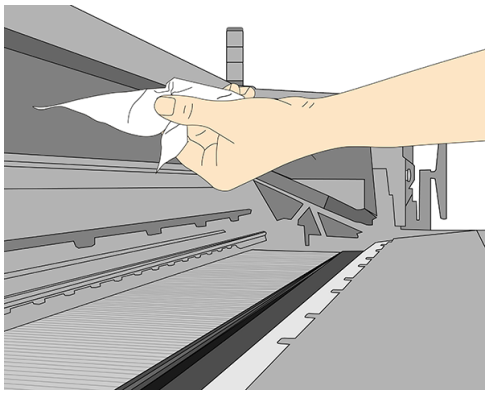
Clean the substrate edge holders (if they are in use)

If you sometimes print with very small side margins and with substrate edge holders, ink may accumulate on the edge holders, which can cause smears on your prints and blocked nozzles in the printheads.

1. Open the window.
2. Remove all substrate edge holders from the platen (there may be two or four of them).
3. Check the substrate edge holder strips for dried ink or any other defect. Clean the ink with a lint-free cloth dampened with distilled water.
4. If necessary, replace the edge holder strips. See Replace an edge holder strip on page 54.

Clean the output platen lights

Clean the output platen lights with a clean cloth or a piece of cellulose paper dampened with distilled water.



See also General cleaning instructions on page 4.

Clean the bottom plate

The following steps provide the complete procedure for this topic.

1. In order to clean the bottom plate, access it from the output cover.

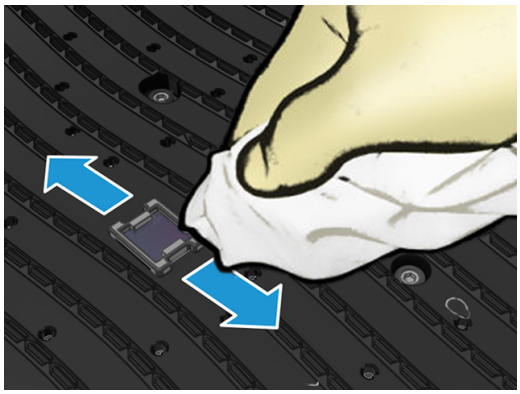
   See General cleaning instructions on page 4.
2. After cleaning, ensure that the cleaned parts are completely dry and that all vapor has completely evaporated.

Clean the substrate-advance sensor

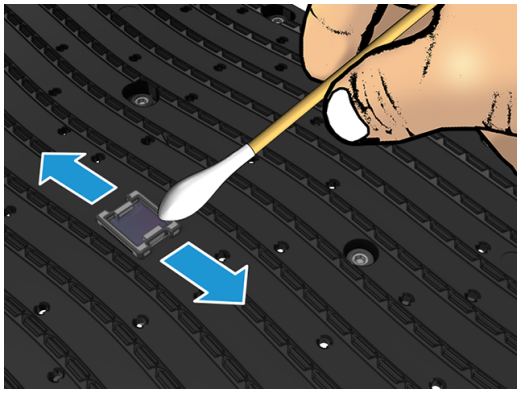
Remember that porous substrates, or substrates with porous liners, are not supported without the ink-collector accessory and should not be used with your printer. However, under normal printing conditions with non-porous substrates, some dirt, dust, and ink aerosol can reach the substrate-advance sensor window and impair the performance of the sensor.

1. Open the window.
2. Find the substrate-advance sensor in the middle of the platen.

3. Clean the platen area around the sensor thoroughly with a lint-free cloth dampened with distilled water. See General cleaning instructions on page 4.



4. Wipe the sensor window with a cotton swab. 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. See also General cleaning instructions on page 4.



5. Continue cleaning with fresh swabs until the cotton stays clean and the sensor window looks clean.
6. Close the window.

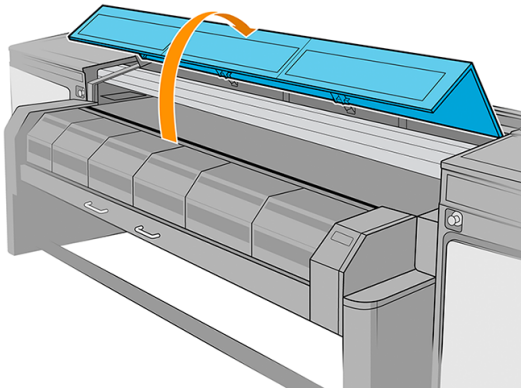
Check and clean the left printhead cleaning blade

The following steps provide the complete procedure for this topic.

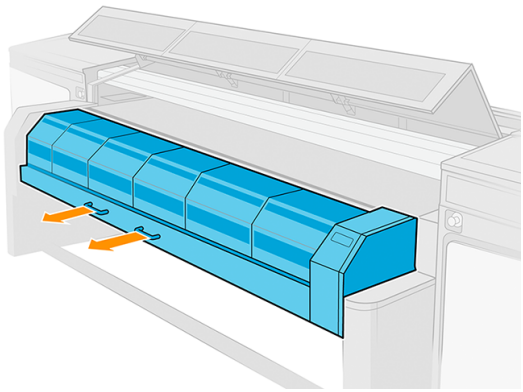
Table 11-11 Warning labels

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				

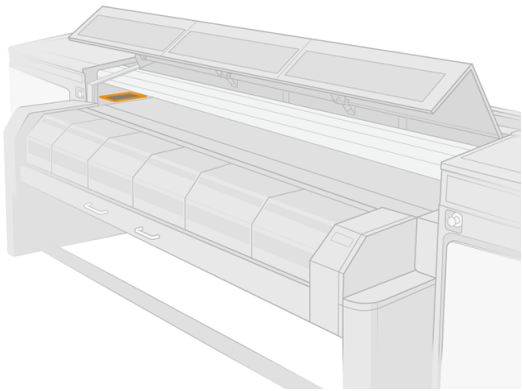
1. Open the window.



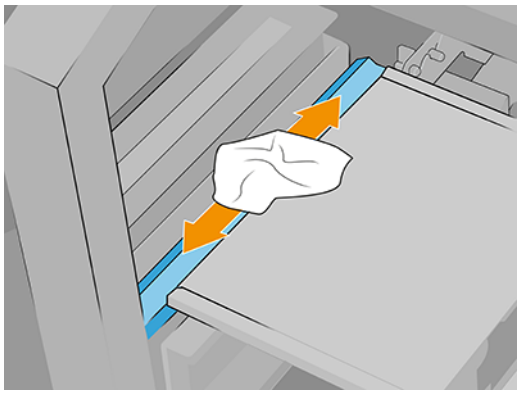
2. Pull out the curing module.



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



4. Clean the left printhead cleaning blade with a lint-free cloth, and distilled water if necessary.



Clean the printhead cleaning system thoroughly

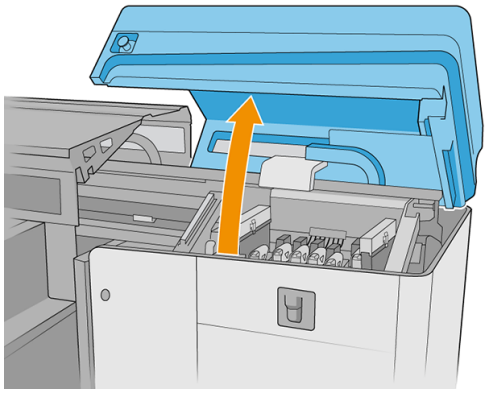
The following steps provide the complete procedure for this topic.

Table 11-12 Warning labels

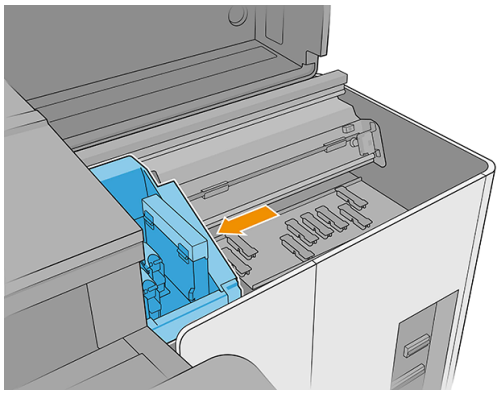
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

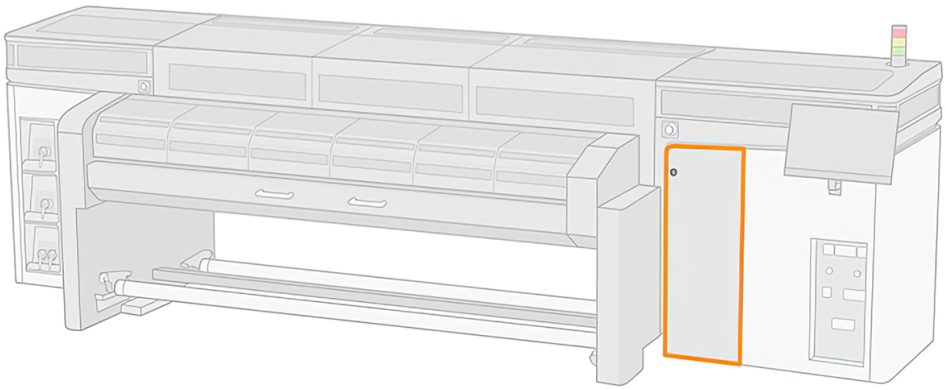
1. Open the carriage cover.



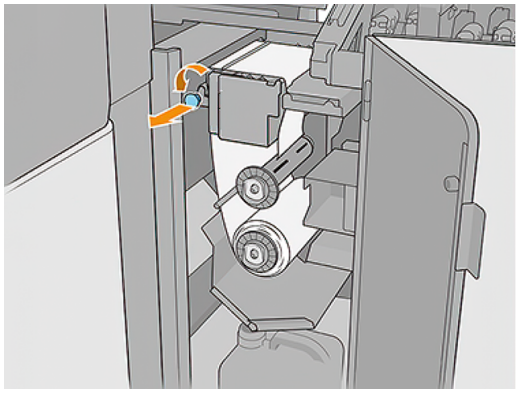
2. Manually move the carriage to the left.



3. Unlock and open the printhead cleaning roll door.

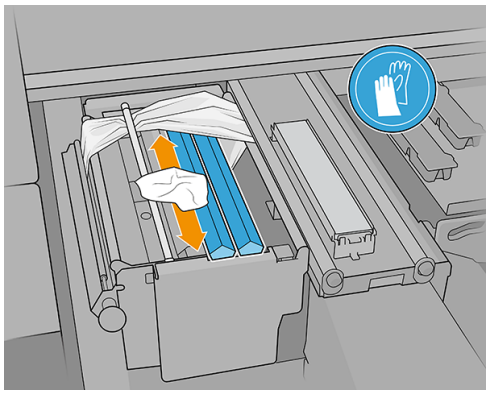


4. Pull the black knob on the upper left and move the pinch mechanism aside.

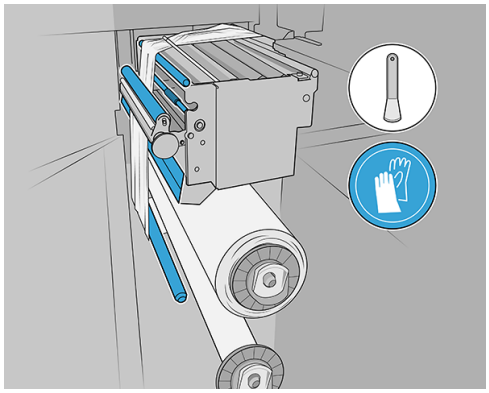


5. Put on gloves.

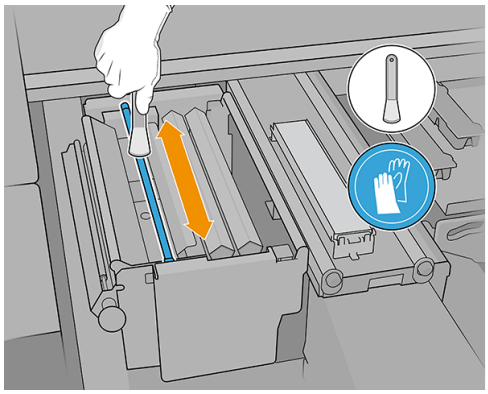
6. Move the printhead cleaning material aside.

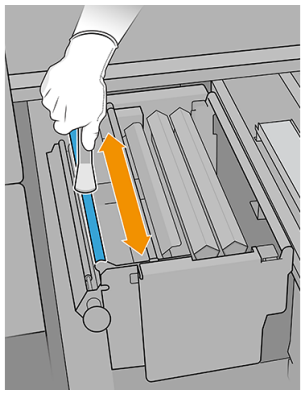


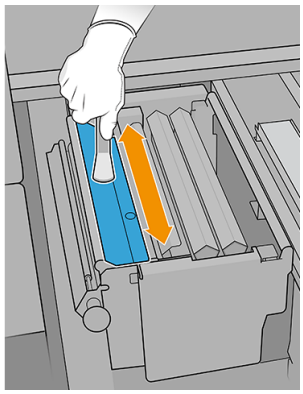
7. Check for accumulated dried ink on the printhead cleaning blades, diverter, rods, plates, drainage ramp below, and lateral surfaces on the left.



8. From the top, scrape off any dried ink on the rods (including the pinch mechanism) and other visible surfaces, using the putty knife provided. Eliminate in particular any dried ink that would touch the cleaning roll material from below in normal operation. Optionally, you can finish off the cleaning process with a lint-free cloth dampened with distilled water.

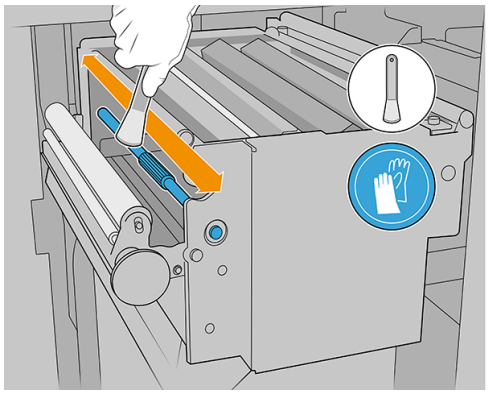


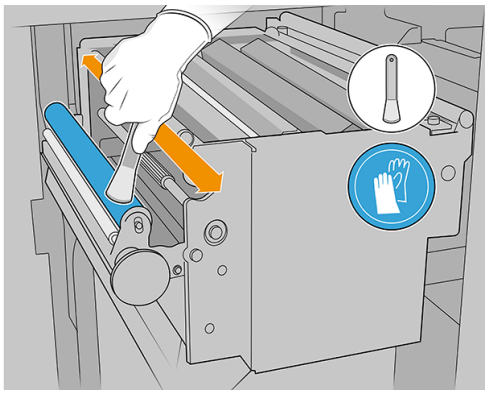




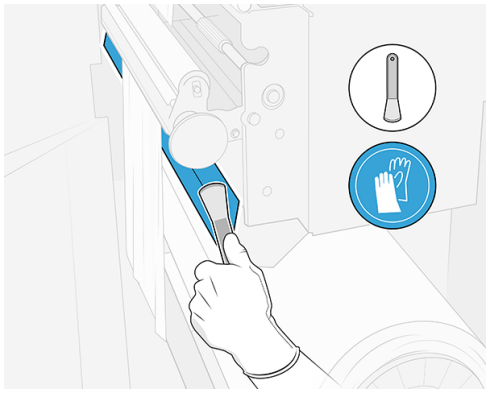
9. From the top and from the left side (opening the central cover), introduce the putty knife carefully to avoid damage to hand or printer. Remove any dried ink close to the white plastic ramp that might

contact the printhead cleaning material in normal operation. Allow the ink particles to fall down to the waste tray below, and from there push the particles into the waste bottle.

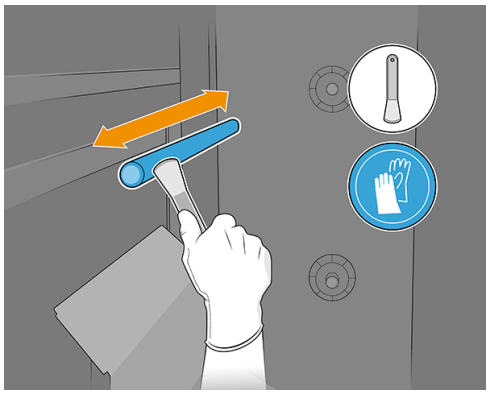




10. Remove dried ink under the white plastic ramp, perhaps using a spiral steel scourer (not provided) if you cannot reach it with the putty knife.



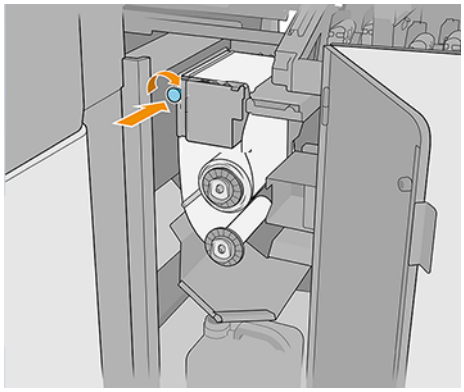
11. Clean the rod in the middle of the cleaning-roll path with the putty knife. Optionally, you can finish off the cleaning process with a lint-free cloth dampened with distilled water.



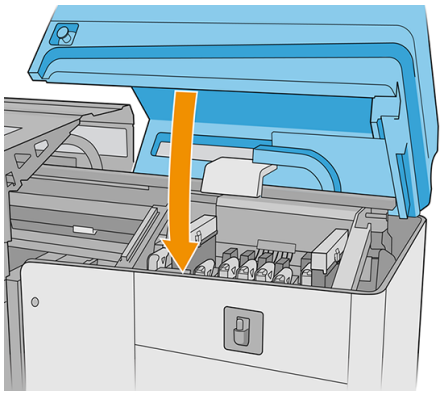
12. Put back the printhead cleaning material to its normal operating condition, being careful to realign it properly (not tilted, without wrinkles). Manually rewind both rolls a little if needed to ensure proper material alignment, but without tightening the material.

13. Close the pinch mechanism by pushing in the black knob.

TIP: To facilitate proper engagement of this mechanism, as already mentioned do not wind the rolls enough to tighten the cleaning material until after the pinch mechanism has been engaged.



14. Close and lock the printhead cleaning roll door.
15. Move the carriage manually to the right.
16. Close the carriage cover.



Clean and lubricate the drop-detector rods

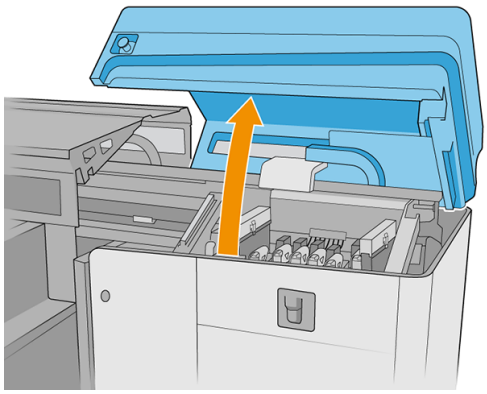
The following steps provide the complete procedure for this topic.

Table 11-13 Warning labels

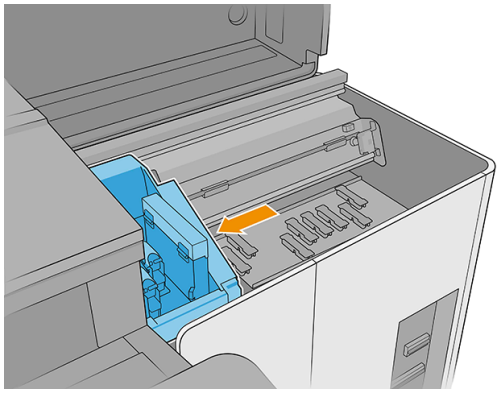
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

1. Open the carriage cover.



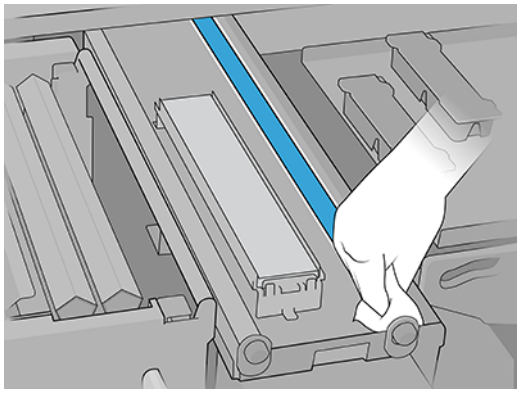
2. Move the carriage manually to the left.



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). Make sure to remove any ink from the rods. Remove any remaining soap foam with a dry cloth.

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



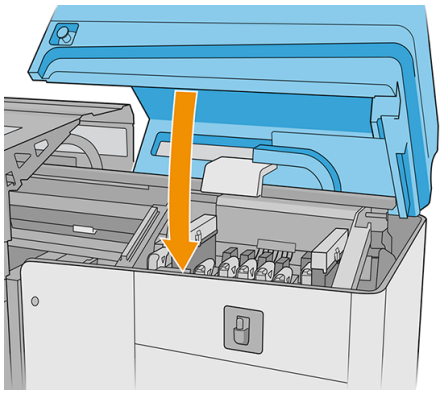
5. Lubricate the rods with two drops of oil on each rod: one at the center and another one at each end. Then put on gloves and spread the oil manually over the rod.

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 the 52002 drop-detection functional test.

Clean the pinchwheels and drive roller

The drive roller should be cleaned whenever it is visibly dirty, or when you notice that substrate advance is no longer smooth and regular.

Table 11-14 Warning

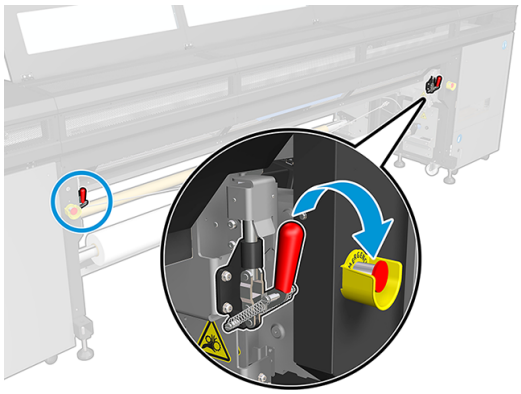
Crush hazard	Risk of trapped fingers	Hazardous moving part
		

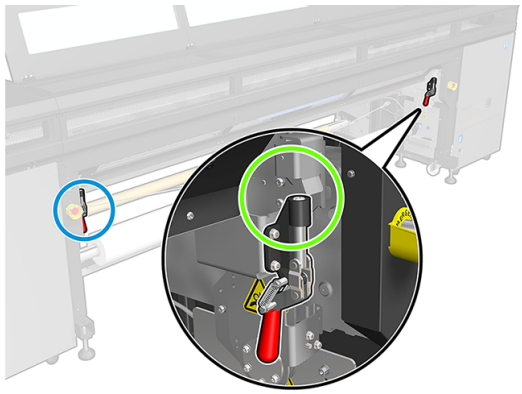
For more safety information, see Safety precautions on page 3

NOTICE: HP recommends that you follow the instructions for this procedure in the Internal Print Server (tap **Maintenance**).

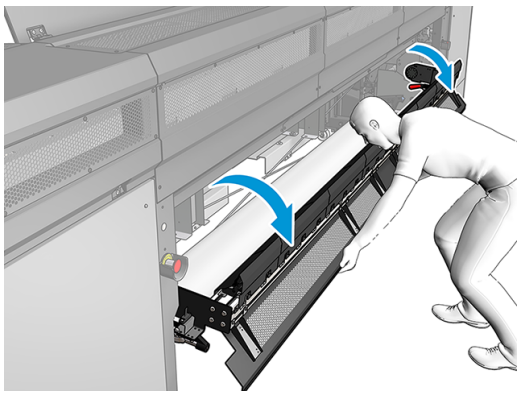
1. Ensure that the printer is not printing.
2. Unload the substrate and raise the carriage beam.

3. Open the loading-table latches.

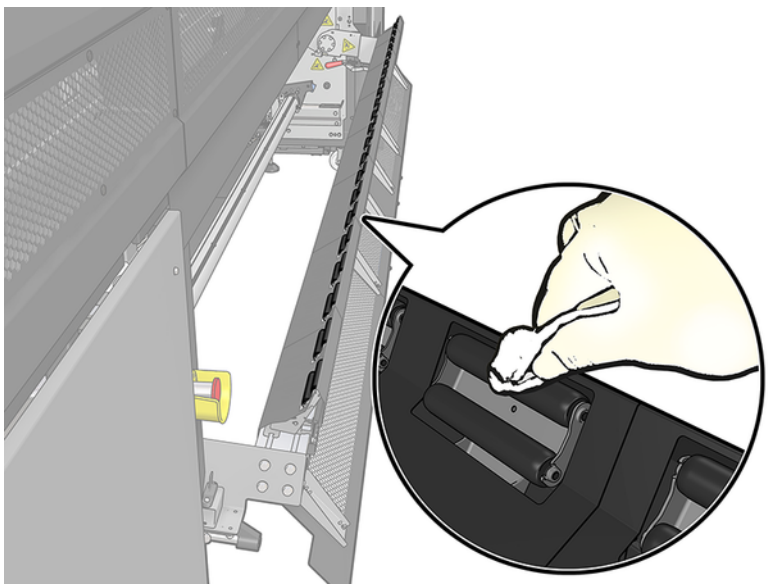




4. Pull the pinchwheel module to its lowest position.



5. Clean the pinchwheels carefully with a cloth dampened with water; do not use petroleum-based cleaning liquids.

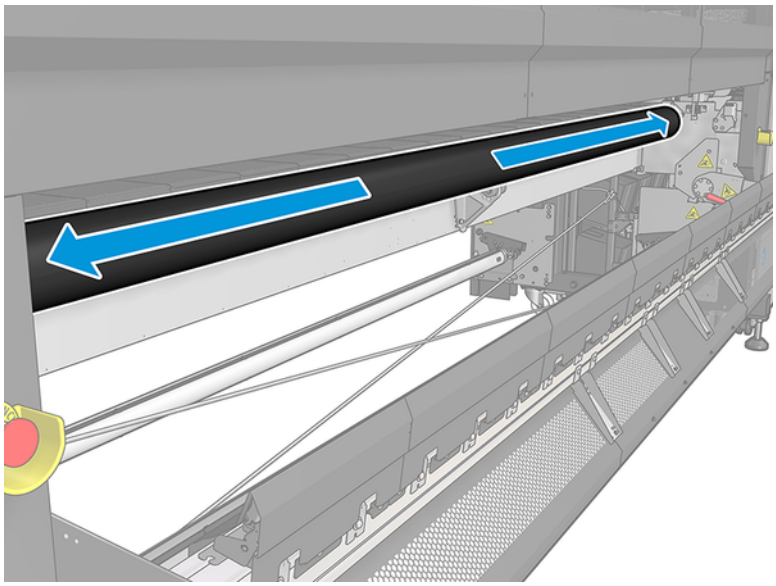


6. Start the drive roller moving slowly backwards.
7. Wait until the drive roller stops.

8. Clean the roller with a clean cloth dampened with water; do not use petroleum-based cleaning liquids.

   Remove any ink from the rods.

⚠ **CAUTION:** Take care not to allow the roller to trap your hands while cleaning.



9. Wait until the roller is dry.
10. Return the pinchwheel module to its original position and close the latches.

Clean the sides of the scan-axis rods, and oil if needed

The following steps provide the complete procedure for this topic.

Table 11-15 Warning labels

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

For more safety information, see Safety precautions on page 3

1. Run the scan-axis diagnostic test. If the test passes, oiling is not needed, and you can omit steps 8 to 10 and 15 to 16 below.

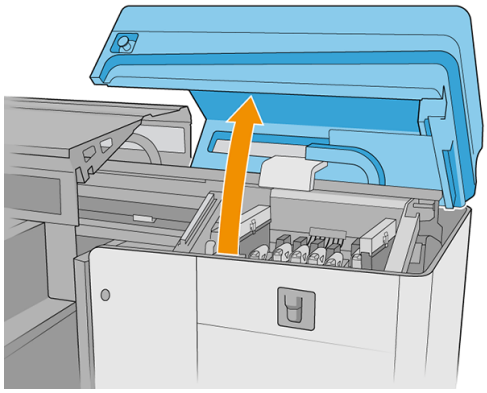
   If the test fails, execute all steps below.

2. Turn off the printer.

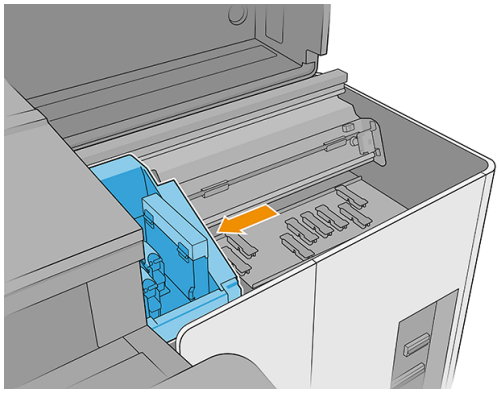
IMPORTANT: Wait for the curing and drying fans to stop spinning.

3. HP recommends wearing gloves when manipulating oiled parts (though not for fastening or unfastening screws).

4. Open the carriage cover to access the scan-axis rods on the right-hand side of the printer.

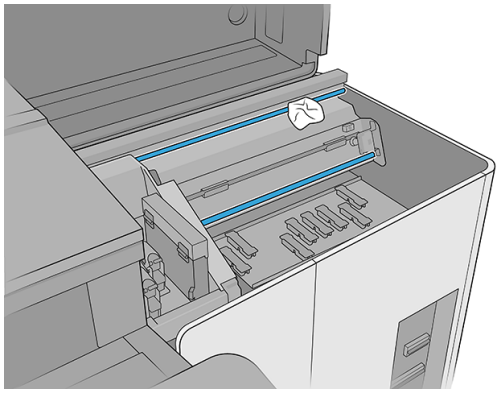


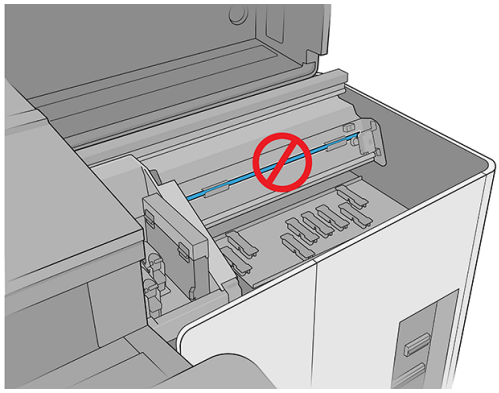
5. Move the carriage manually to the left to access the rightmost part of the rods.



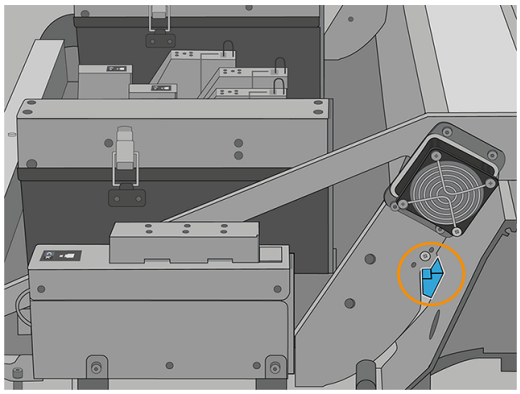
6. You will see a ring of dust on the top and bottom rods. Clean the rods with a lint-free cloth dampened with distilled water or with general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.

CAUTION: When cleaning the lower front rod, avoid cutting yourself with the encoder strip, or breaking it.

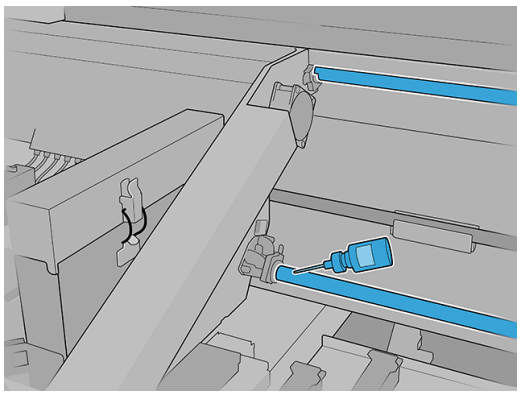




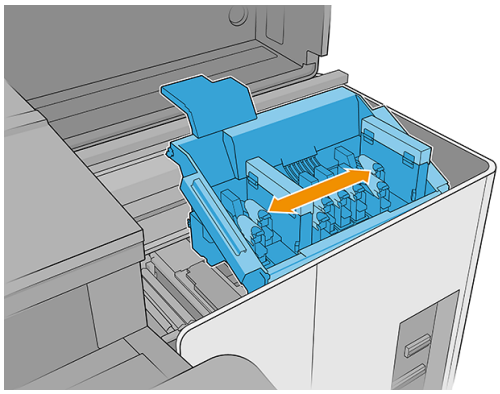
7. Clean any debris located in the carriage plates (especially in the right-hand plate) with a cotton swab, to prevent encoder malfunction.



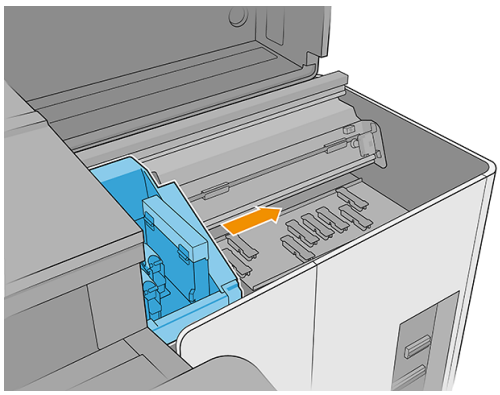
8. Allow the rods to dry, then lubricate them with a few drops of the lubricant provided in the user maintenance kit.



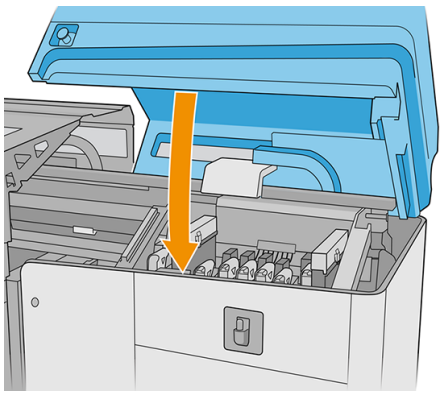
9. Move the carriage from side to side to spread the lubricant evenly over the rods.



10. Move the carriage back to the right.

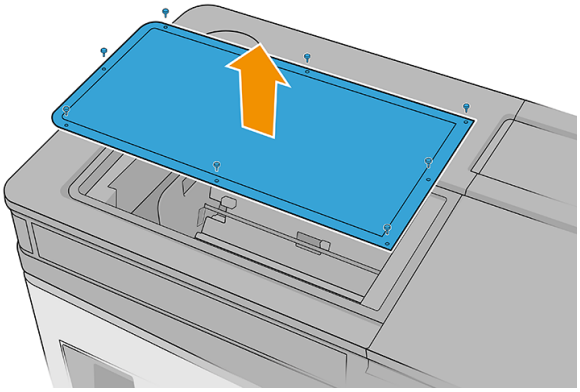


11. Close the carriage cover.



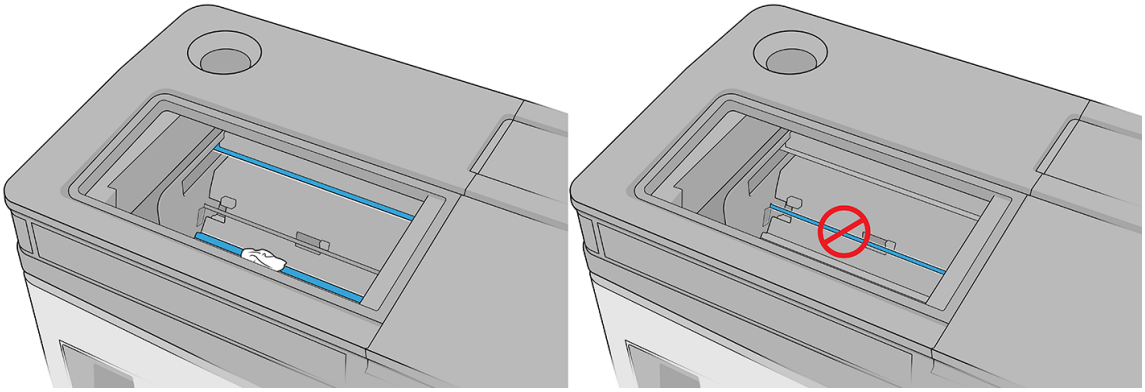
12. Remove the top left cover to access the scan-axis rods on the left-hand side of the printer.

⚠ **CAUTION:** Take care not to damage the encoder strip.

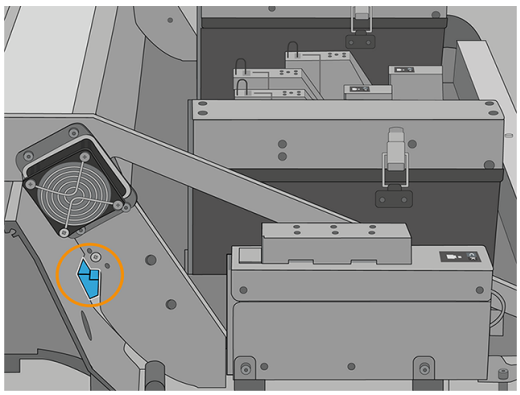


13. You will see a ring of dust on the top and bottom rods. Clean the rods with a lint-free cloth dampened with distilled water or with general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.

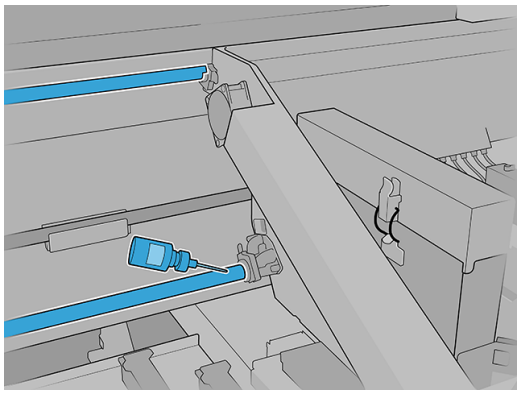
⚠ **CAUTION:** When cleaning the rods, avoid cutting yourself with the encoder strip, or breaking it.



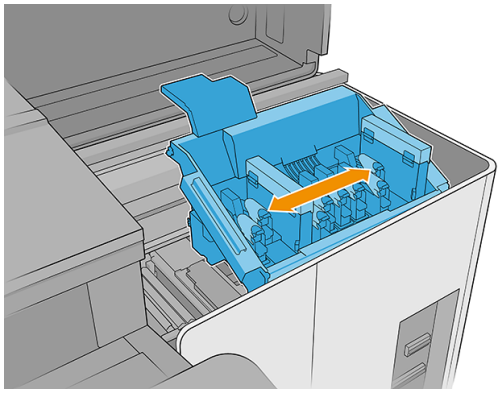
14. Clean any debris located in the carriage plates (especially in the left-hand plate) with a cotton swab, to prevent encoder malfunction.



15. Allow the rods to dry, then lubricate them with a few drops of the lubricant provided in the user maintenance kit.



16. Move the carriage from side to side to spread the lubricant evenly over the rods.



17. Put back the top left cover.
18. Turn on the printer.
19. Wait until the rearm button blinks, then press it.
20. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Replace an intermediate tank

The following steps provide the complete procedure for this topic.

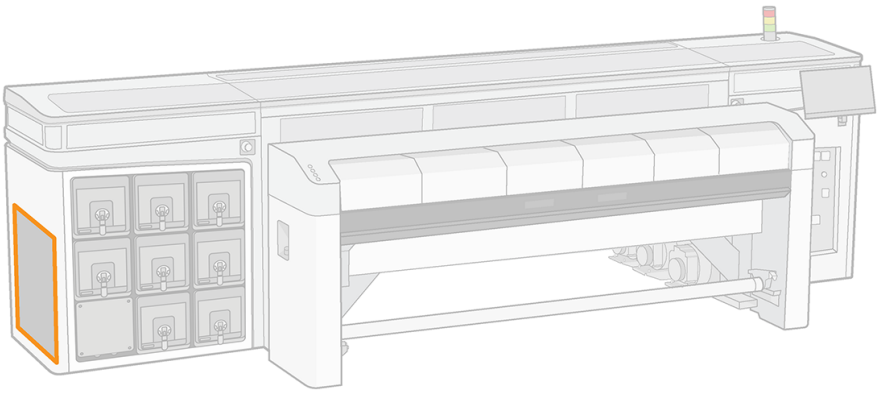
Table 11-16 Warning labels

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				

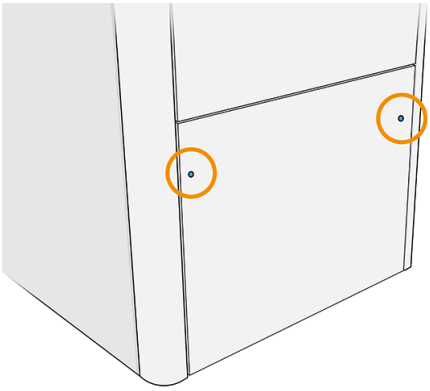
HP recommends wearing gloves for this operation.

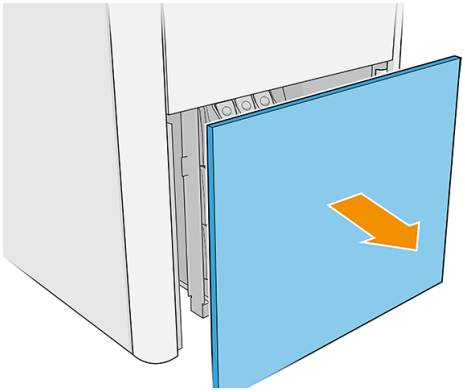


1. Ensure that you have the intermediate tank kit, which is included in the user maintenance kit.
2. Ensure that the printer is not printing.
3. Run the appropriate diagnostic test and follow the instructions on the screen to prepare the printer.
4. Locate the left side cover.



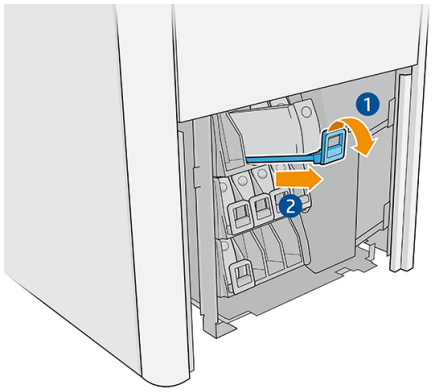
5. Remove the cover when prompted by the printer.

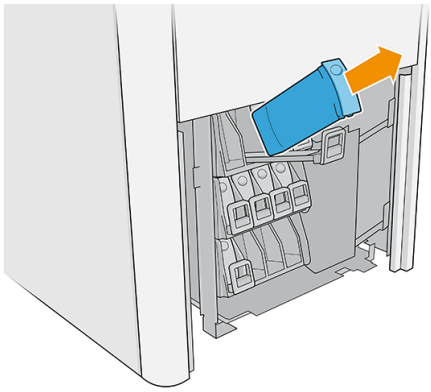




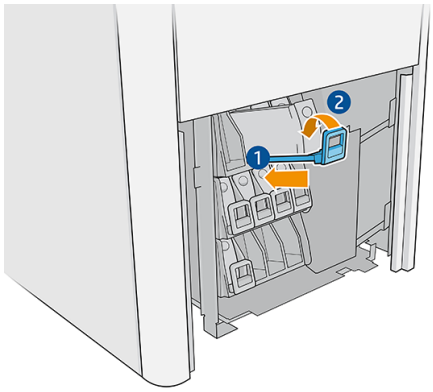
6. Remove the intermediate tank when prompted by the printer.

NOTE: The illustration may not be representative of the tank's position in the printer.





7. Place the appropriate colored label on the new intermediate tank.
8. Insert the new intermediate tank.



The printer automatically fills the intermediate tank, and detects when it is full.

9. Reinstall the side cover.
10. Run the appropriate diagnostic test.

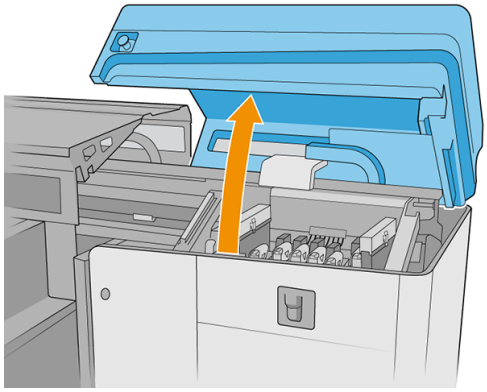
Replace the white service-station cap (FS50 W/FS60 W only)

The following steps provide the complete procedure for this topic.

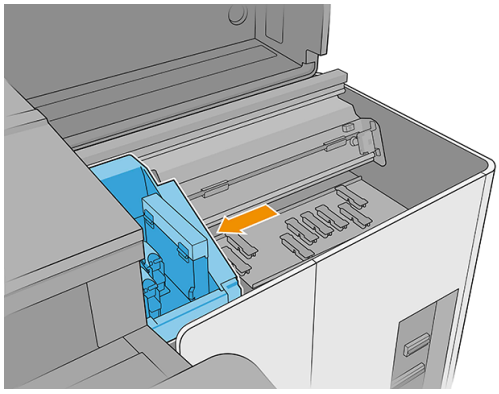
Table 11-17 Warning labels

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.

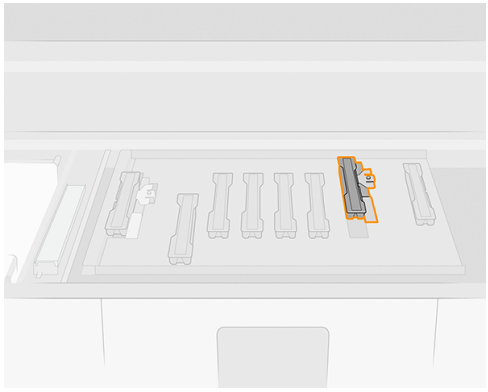


2. Move the carriage manually to the left in order to access the service-station caps.

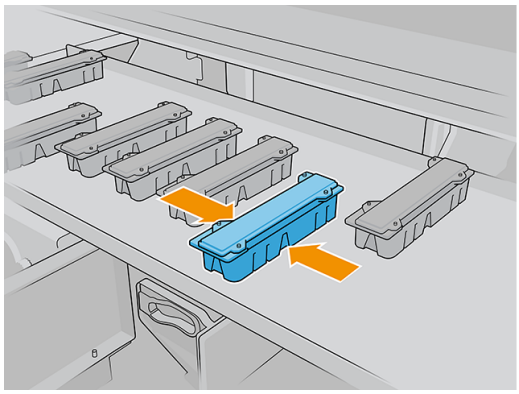


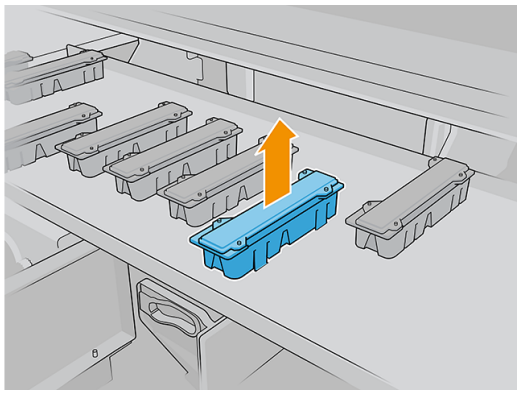
3. Move the slot 7 switch to the intermediate position (B).

⚠ CAUTION: Take note of the configuration of the capping system. At the end of the process you will be required to restore the system to its initial configuration.



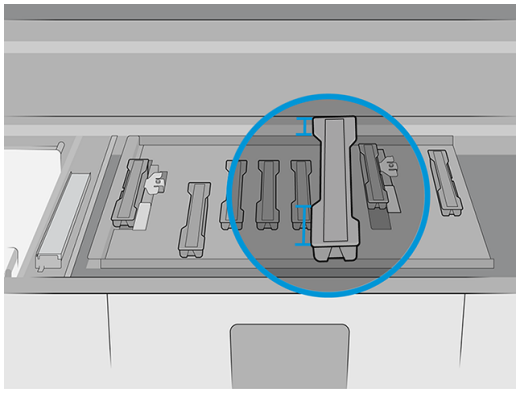
4. Remove the service-station cap by pressing on the four lateral fixings (two each side), and pulling up.





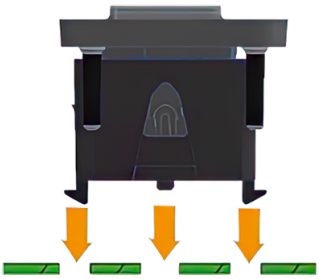
5. Correctly orient the new cap in the capping station.

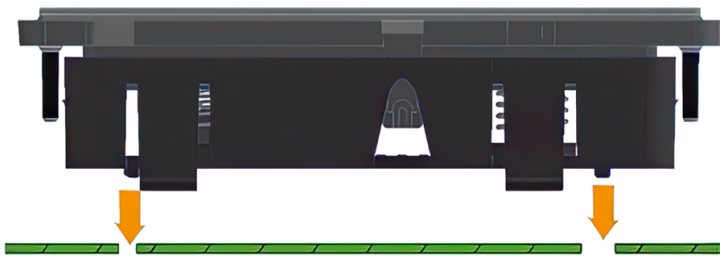
NOTE: The cap is asymmetrical.



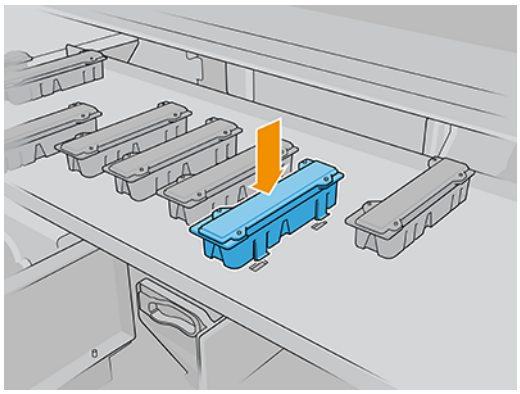
6. Locate the pins under the cap assembly and align them with the holes.

IMPORTANT: Do not tilt the cap assembly.

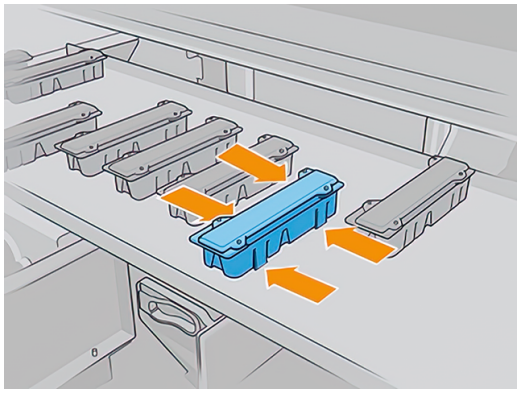




7. Lower the cap into position.



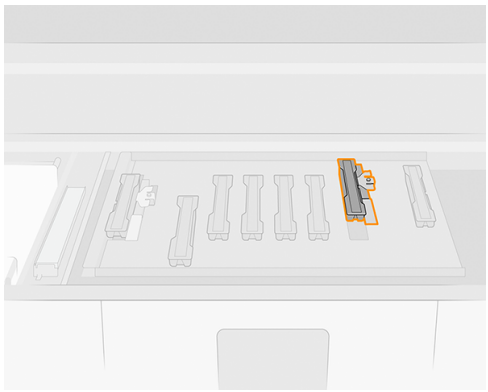
8. Once the cap touches the printer, without tilting, press the sides of the four snap-fit features and press lightly downwards to finish insertion



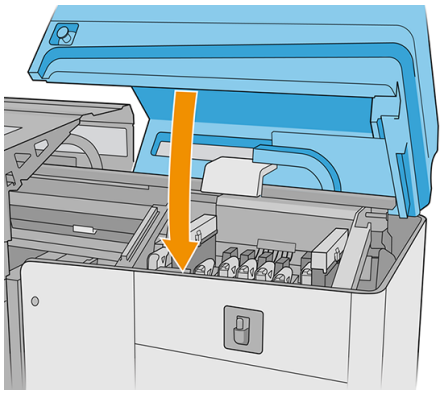
IMPORTANT: When it is in place, ensure that the rubber surface that covers the service-station cap is correctly located on the four pins.

9. Move the slot 7 switch back to its original position.

CAUTION: Movable slot configuration and capping configuration must be aligned, otherwise printhead health could be affected.



10. Close the carriage cover.



Clean the needles and caps inside the storage box (FS50 W/FS60 W only)

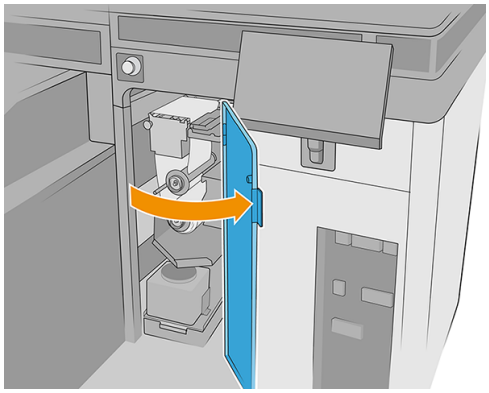
The following steps provide the complete procedure for this topic.

Table 11-18 Warning labels

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

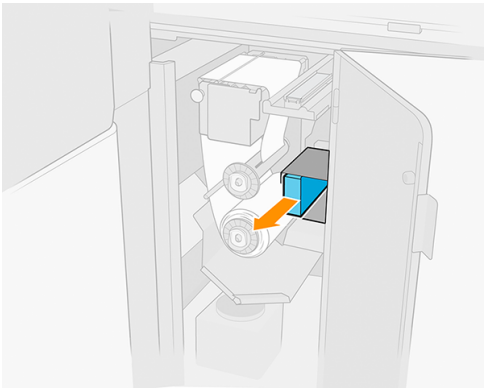
For more safety information, see Safety precautions on page 3

1. Open the cleaning-roll door.

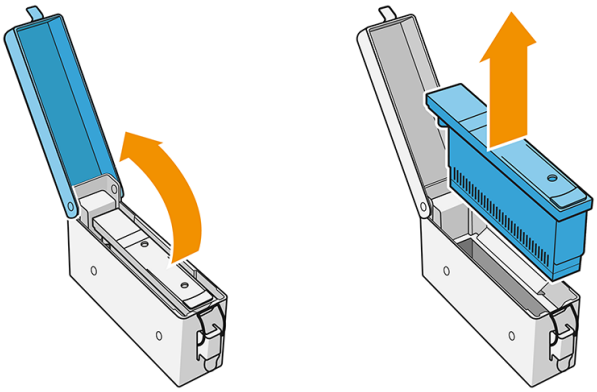


2. Wait for the wheel to stop.

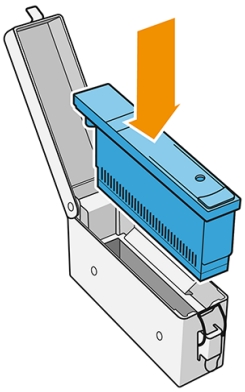
3. Remove the storage box from the wheel.



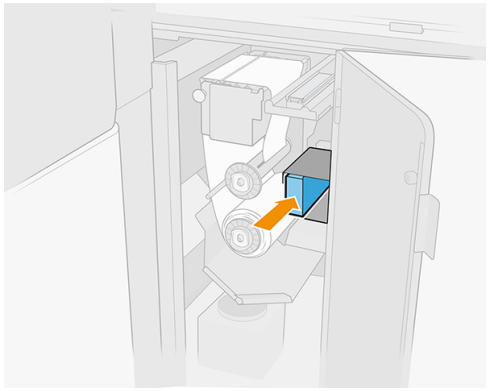
4. Open the storage box and remove the printhead inside.



5. Check the plastic needles and clean off any ink remaining on them.
6. Check the cap and clean off any ink remaining on it.
7. Put the printhead back into the storage box, and close the box.



8. Put the storage box back into the wheel.



9. Close the printhead cleaning roll door.

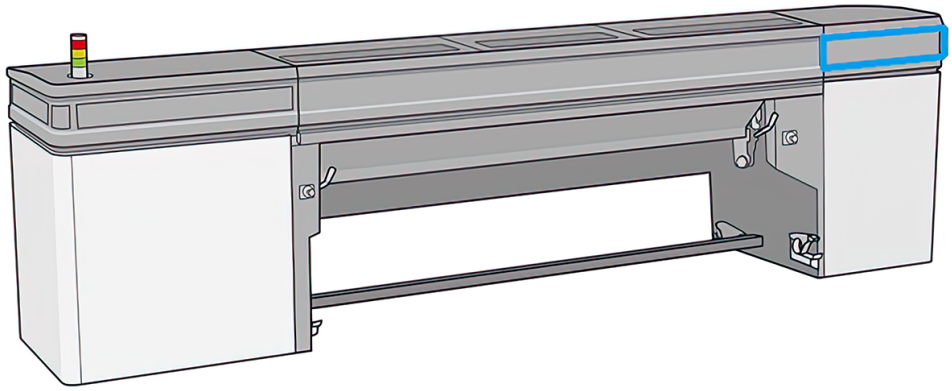
Clean the drying filter (IDS side)

The following steps provide the complete procedure for this topic.

1. Turn off the printer and the power-enable switch.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

2. Remove the rear IDS small cover and locate the fan.

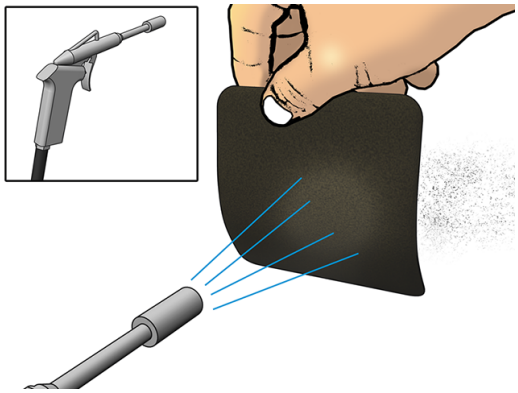


3. Pull off the plastic cover of the drying filter.



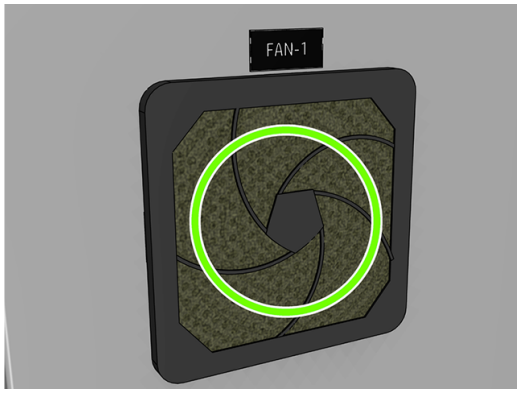
4. Clean the drying filter by blowing it with an air gun.

⚠ **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 back the filter and cover. Ensure that the filter covers the fan's square surface.



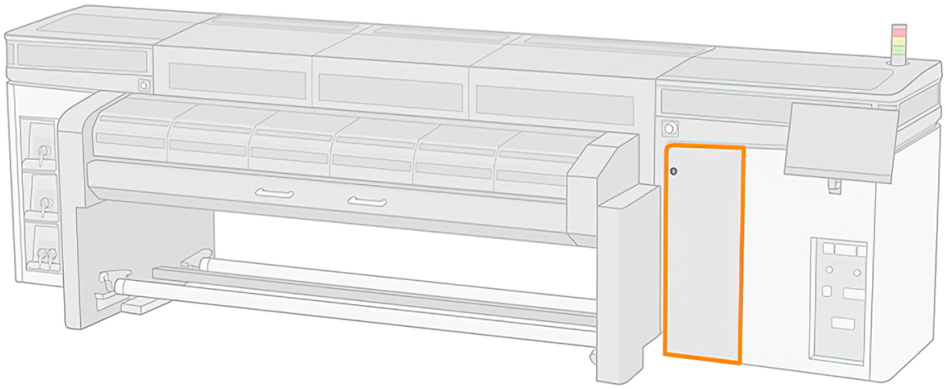


6. Put back the rear IDS small cover.
7. Turn on the printer.

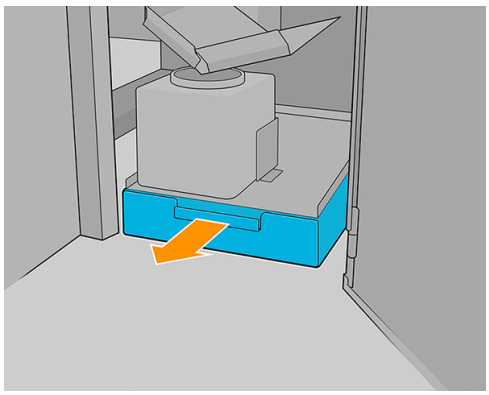
Clean the water-tank filter

When the printer has signaled that the water tank is empty, you should be able to put at least 5 liters of water into it. If not, clean the water-tank filter as explained below.

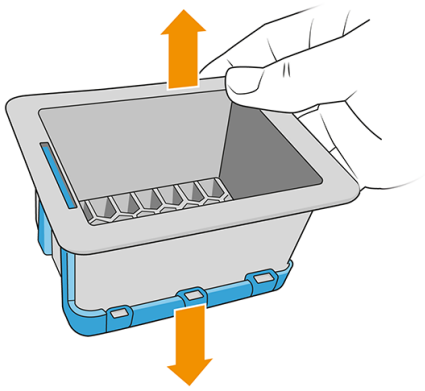
1. Unlock and open the printhead cleaning roll door.



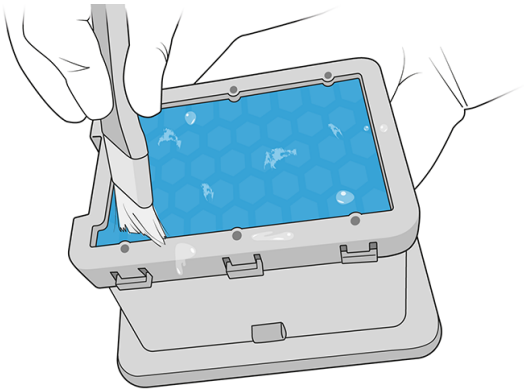
2. Extract the water tank, and open its lid.



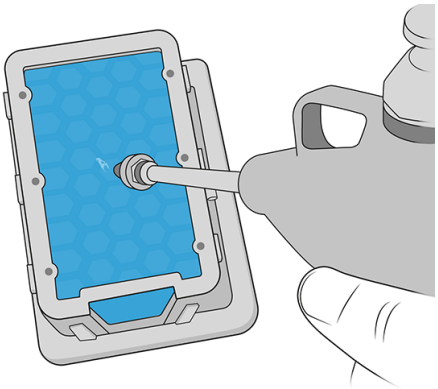
3. If the filter appears clogged or the water flows very slowly, remove the filter by pinching the front and back faces.



4. Clean the filter with a soft brush and warm water on both the inside and the outside. Make sure to rinse it well before placing it back in the printer. You can use tap water to clean and rinse the filter.



5. Blow out the rest of the dirt with compressed air, from the bottom.



6. Put the filter back into the tank.
7. Put the tank back into the printer.
8. Close and lock the printhead cleaning roll door.

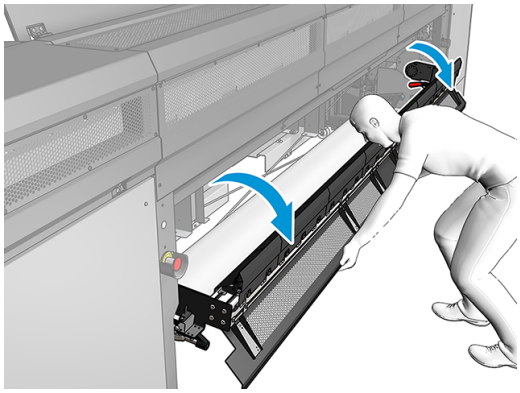
Clean the drying-fan guards

HP recommends wearing gloves throughout this operation.

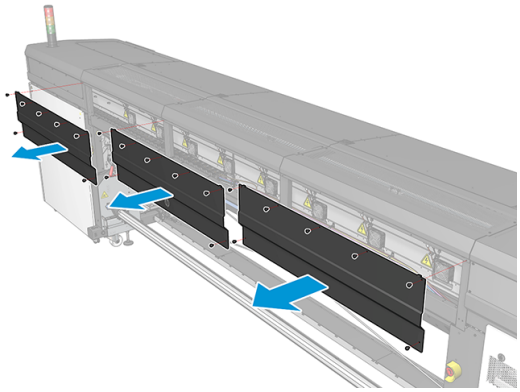
1. Unload the substrate and raise the carriage beam.



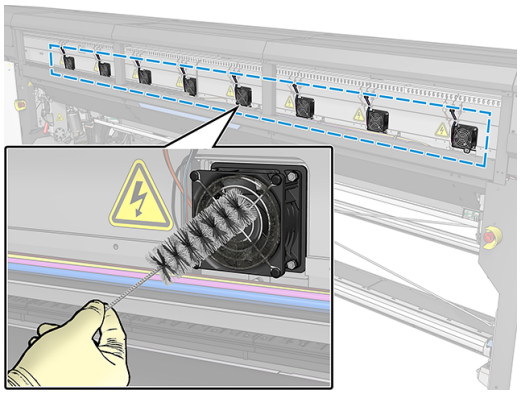
2. Turn off the printer.
3. Turn off the main printer switch.
4. Turn off the e-box electronics switch.
5. Open the loading table.



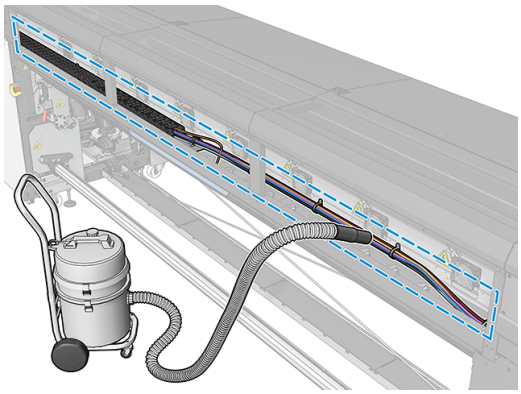
6. Remove seven T20 screws from each central rear cover, then remove the three covers.

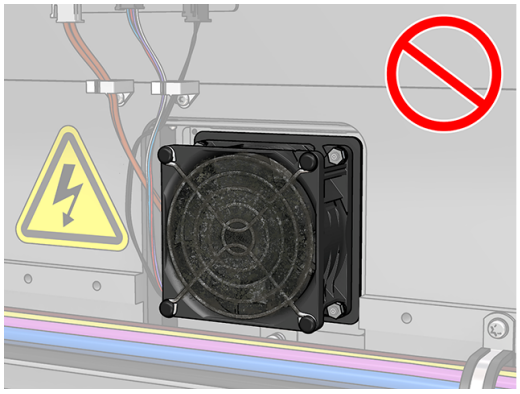


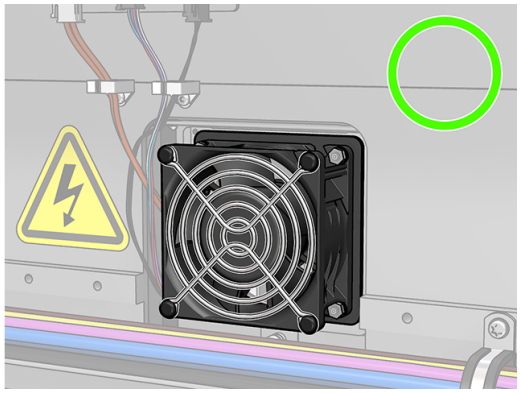
7. Clean the eight drying-fan guards with the brush provided.



8. Remove any loose fallen dirt with a vacuum cleaner.







9. Reinstall the three central covers.
10. Close the loading table.
11. Turn on the printer.
12. Wait until the rearm button blinks, then press it.
13. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.
14. In the Internal Print Server, move the scan beam to the printing position.

Clean the bottom of the carriage and the line sensor

The following sections provide details for this topic.

Table 11-19 Warning labels

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

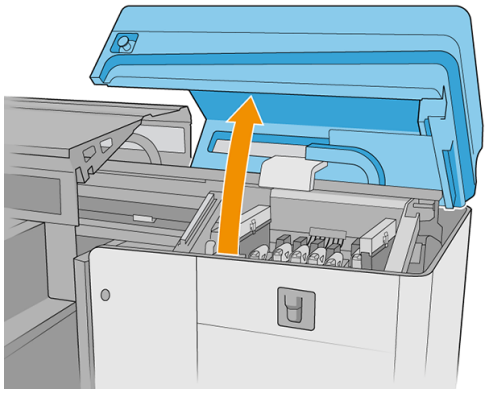
HP recommends wearing gloves for these cleaning operations.



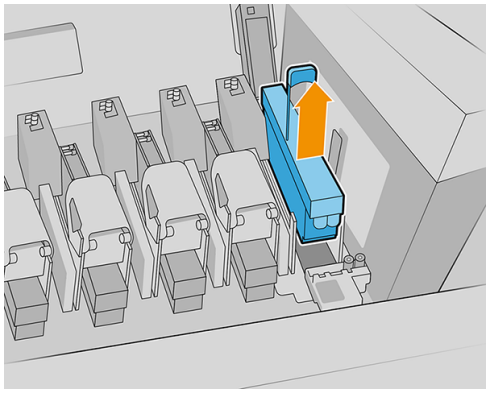
Clean the bottom of the carriage

The following steps provide the complete procedure for this topic.

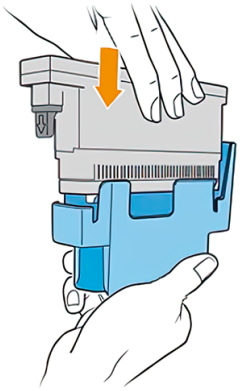
1. Open the carriage cover.



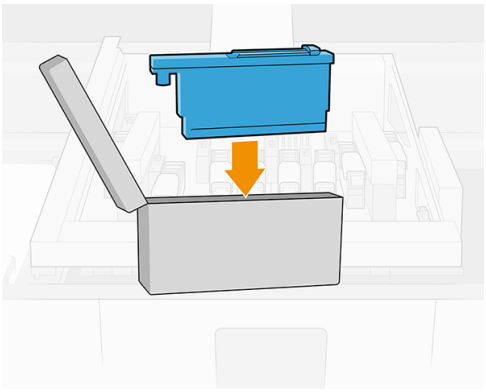
2. Remove the printheads from the printer.



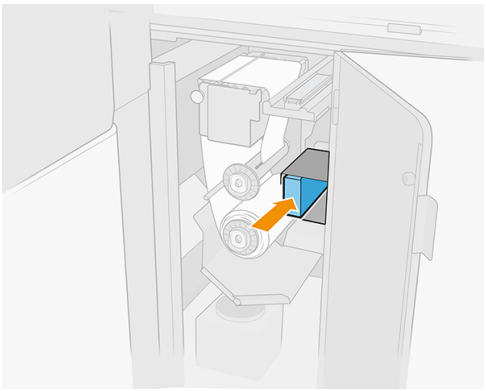
3. Store the printheads in their protective caps.



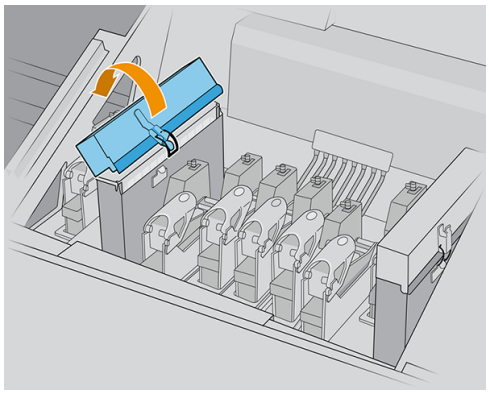
4. FS50 W/FS60 W only: Store the white printhead in its storage box.

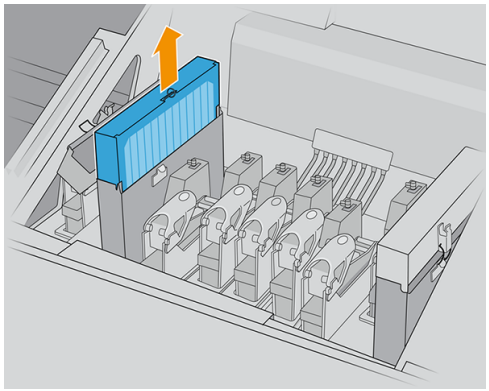


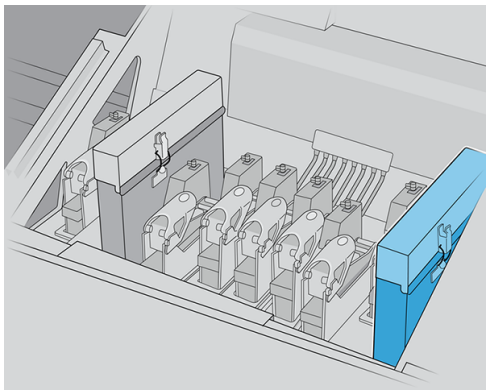
5. FS50 W/FS60 W only: Put the storage box into the wheel. Close the cleaning-roll door.



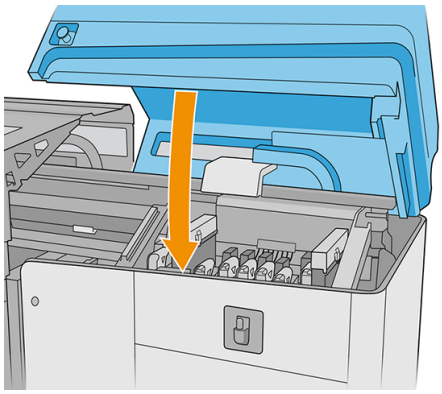
6. Remove the aerosol filters.



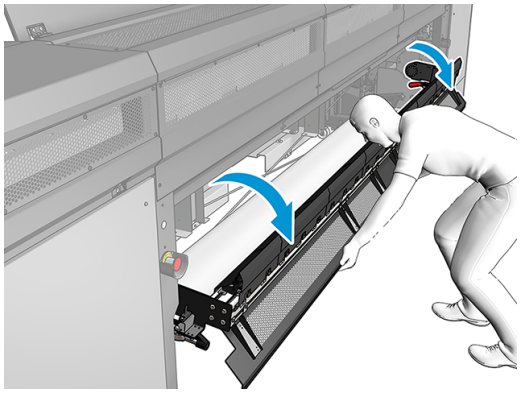




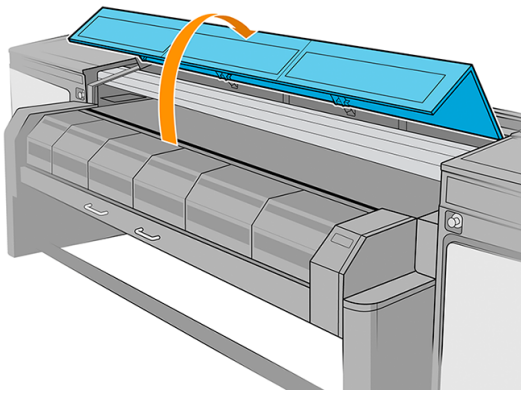
7. Close the carriage cover.



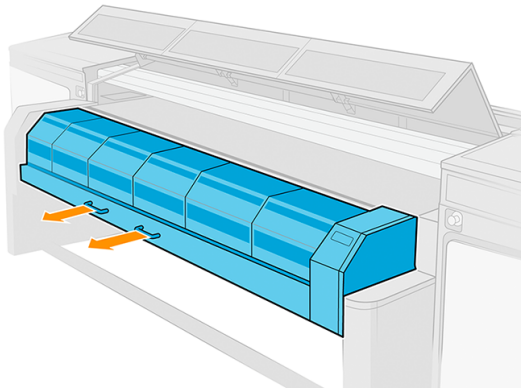
8. Move the scan axis to the topmost position.
9. Turn off the printer.
10. Turn off the main printer switch. Turn off the e-box electronics switch.
11. Open the loading table.



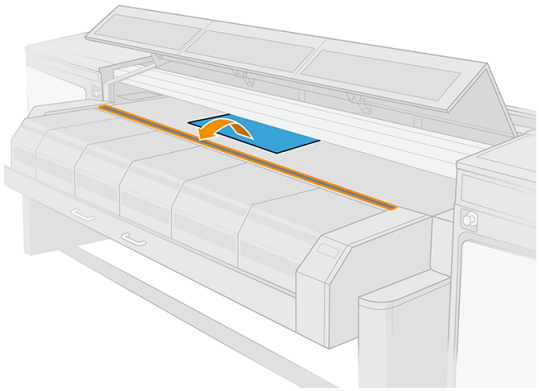
12. Open the front window.

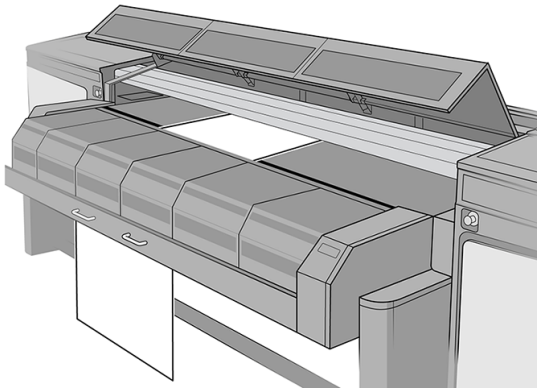


13. Open the curing module.

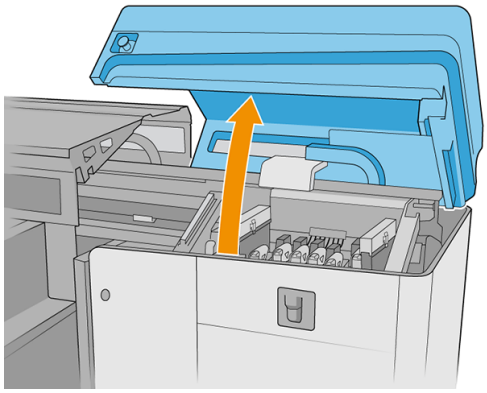


14. Put a piece of substrate in the middle of the platen to capture the dirt.

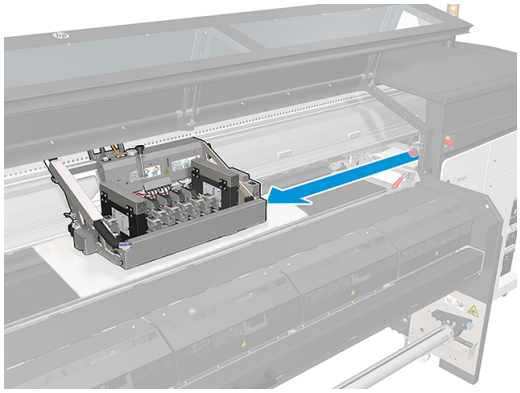




15. Open the carriage cover.



16. Move the carriage to the left, over the piece of substrate.

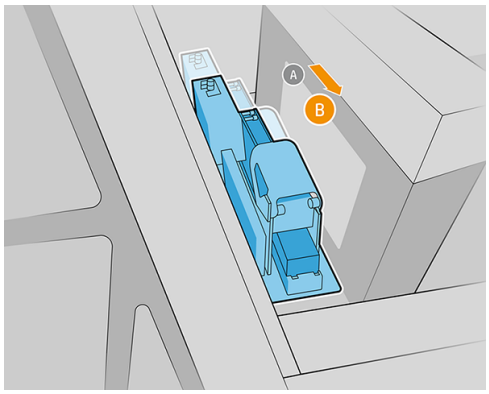


Clean all the slots, at the front and rear of the printer

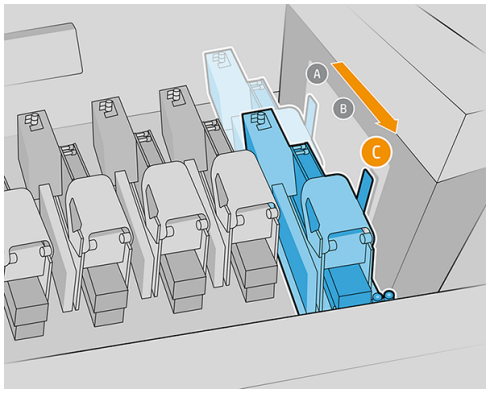
The following steps provide the complete procedure for this topic.

IMPORTANT: FS50 W/FS60 W only: Take note of the initial configuration of the movable slot system. At the end of the process you will be required to restore the initial configuration.

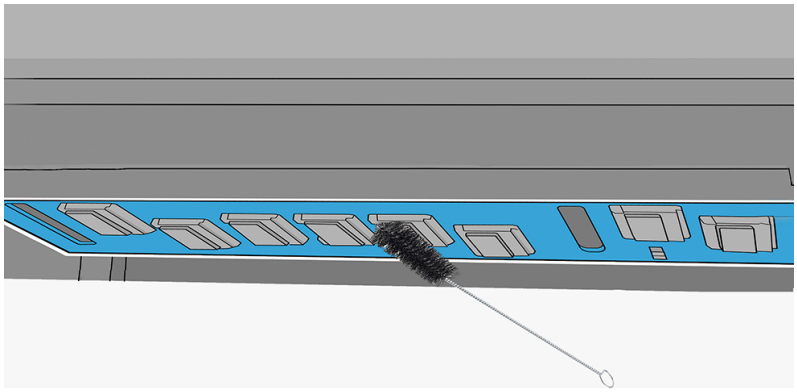
1. FS50 W/FS60 W only: Move printhead 1 to overflood configuration.



2. FS50 W/FS60 W only: Move printhead 7 to overflood configuration.



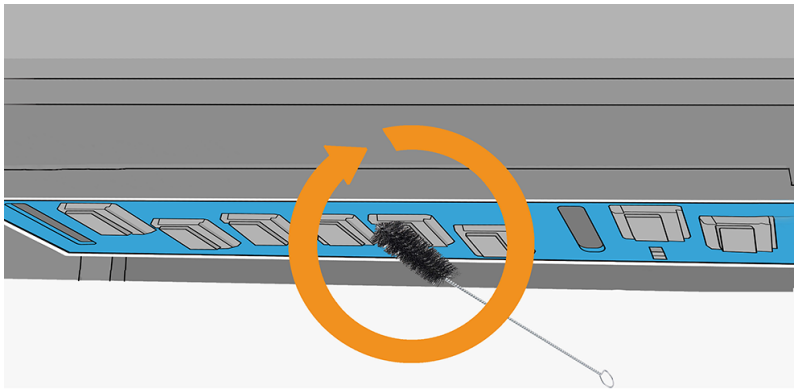
3. Insert the brush between carriage and platen from the front of the printer.



4. Rotate the brush clockwise to clean the undercarriage of each printhead slot.

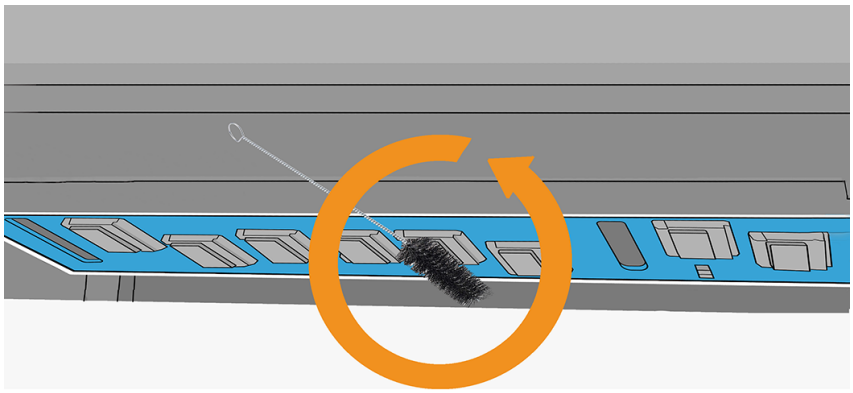
CAUTION: Be very careful with the EE pins inside the printhead pocket.

NOTE: The rear of some slots cannot be reached in this step. Those areas will be cleaned in the following steps.

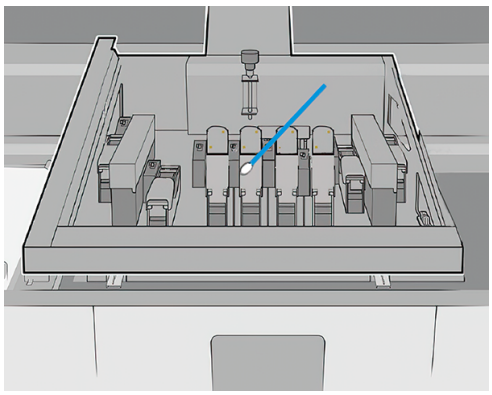


5. Go to the rear of the printer, and insert the brush between carriage and platen. Rotate the brush counter-clockwise to clean the undercarriage of each printhead slot.

⚠ **CAUTION:** Be very careful with the EE pins inside the printhead pocket.



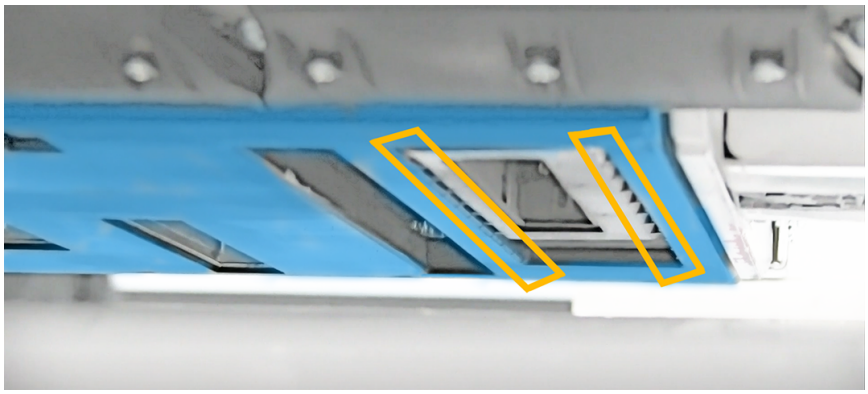
6. Wipe the inside of each slot with one of the cotton swabs provided in the kit.



FS50 W/FS60 W only: Printhead slots 1 and 7: Clean the ribs in the undercarriage protector

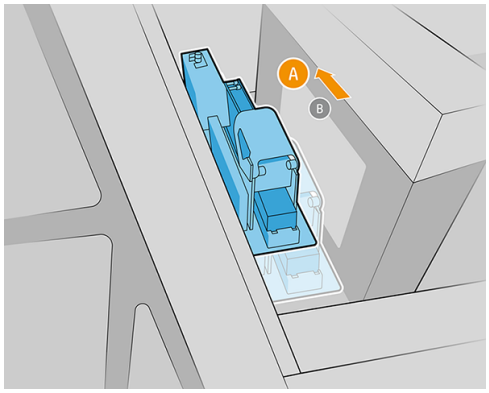
The following steps provide the complete procedure for this topic.

1. From the rear of the printer, insert the brush between carriage and platen. Focus on the ribs in the undercarriage protector, and brush the undercarriage from side to side to remove any dirt.



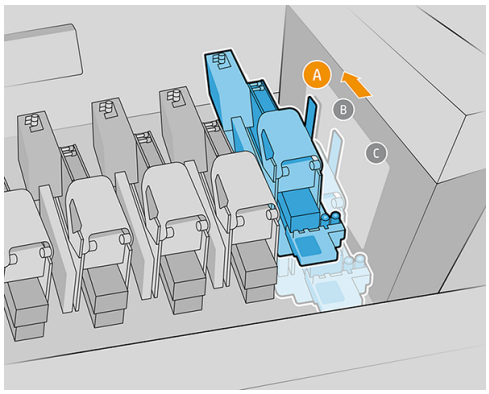
2. Move printhead slot 1 to the color position: Unscrew and push the slot to the front.

IMPORTANT: Take note of the initial configuration of the movable slot system. At the end of the process you will be required to restore the initial configuration.

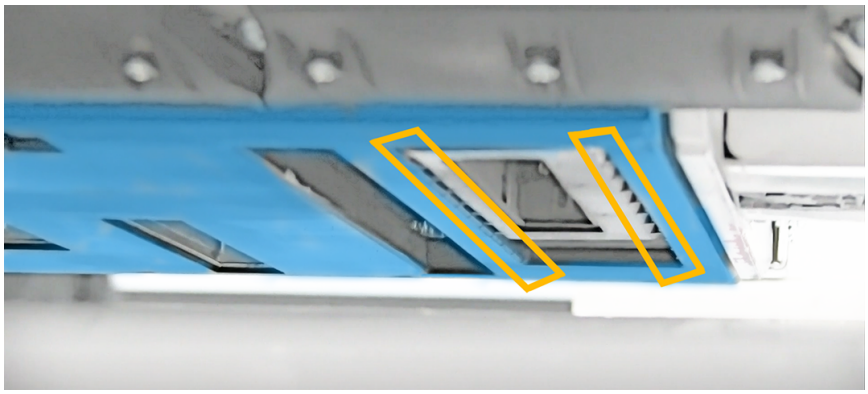


3. Move printhead slot 7 to the underflood position: Unscrew and push the slot to the end.

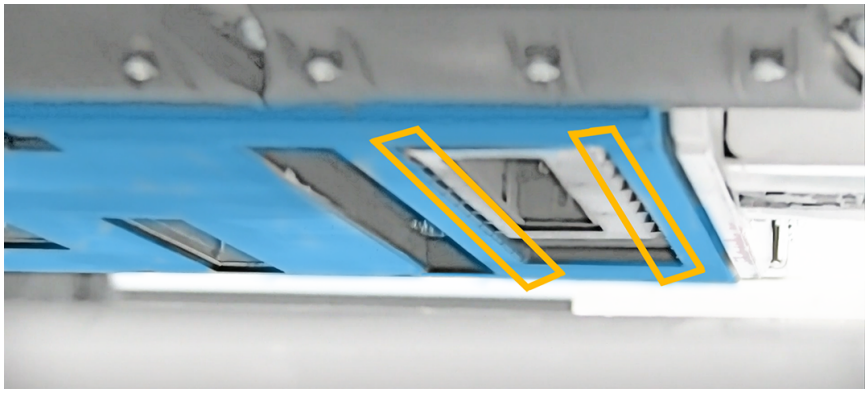
IMPORTANT: Take note of the initial configuration of the movable slot system. At the end of the process you will be required to restore the initial configuration.



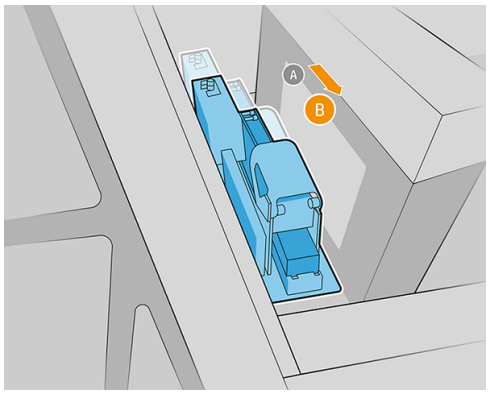
4. From the rear of the printer, insert the brush between carriage and platen. Focus on the ribs in the undercarriage protector, and brush the undercarriage from side to side to remove any dirt.



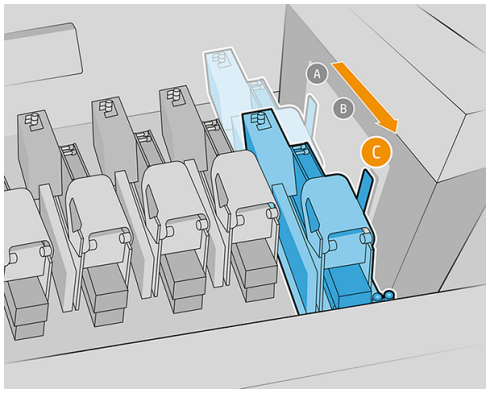
5. From the front of the printer, insert the brush between carriage and platen. Focus on the ribs in the undercarriage protector, and brush the undercarriage from side to side to remove any dirt.



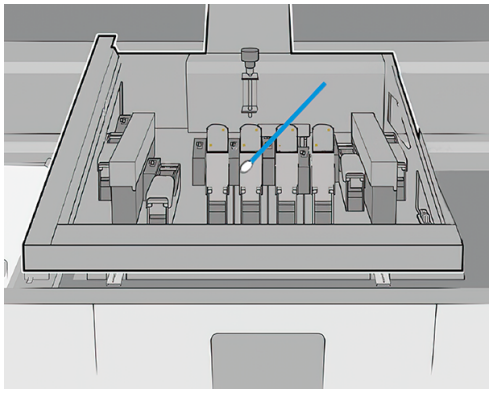
6. Move printhead slot 1 to the overflood position. Repeat the cleaning process from the front of the printer.



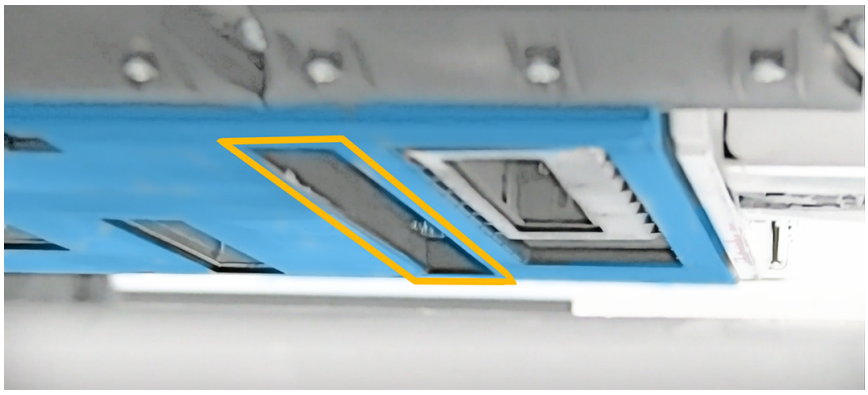
7. Move printhead slot 7 to the overflood position. Repeat the cleaning process from the front of the printer.



8. From the top of the carriage, insert a cotton swab into each printhead slot and carefully clean the seals of each slot.



9. Insert the brush between carriage and platen into the aerosol removal slots. Brush the undercarriage from side to side to remove any dirt.

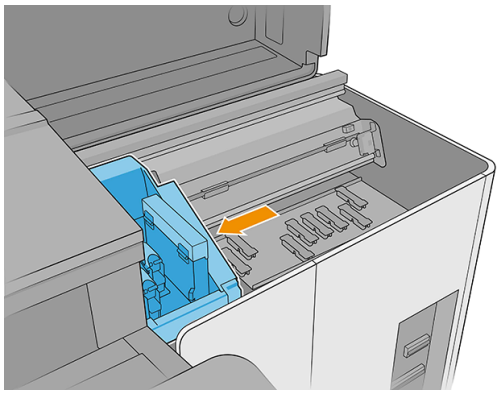


Finish the cleaning operations

The following steps provide the complete procedure for this topic.

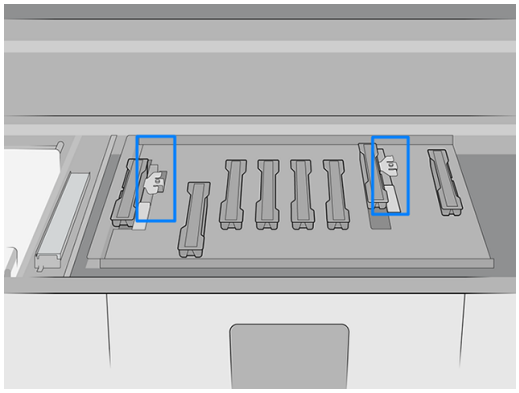
1. FS50 W/FS60 W only: Reset the movable slot system to its original configuration.

2. Check the status of the capping system and clean it, if necessary.

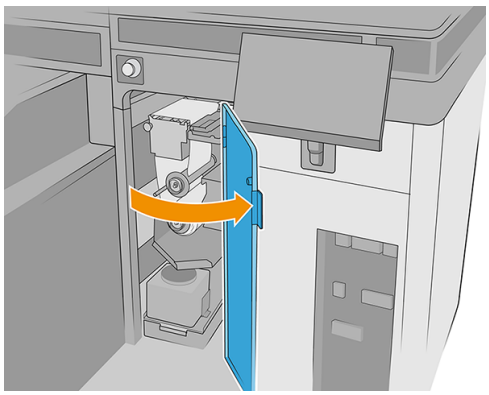


3. FS50 W/FS60 W only: Reset the capping station to its original configuration.

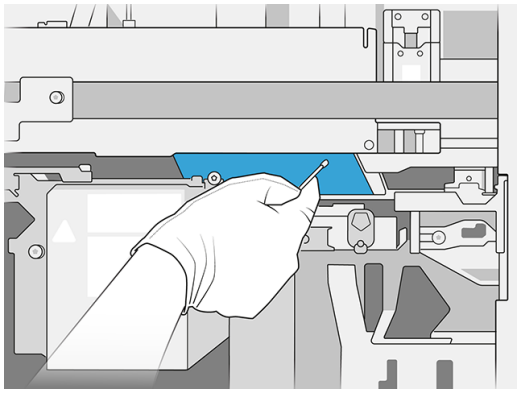
⚠ **CAUTION:** FS50 W/FS60 W only: Movable slot configuration and capping configuration must be aligned, otherwise printhead health could be affected.



4. Carefully remove the substrate from the platen and dispose of it.
5. Open the cleaning-roll door.

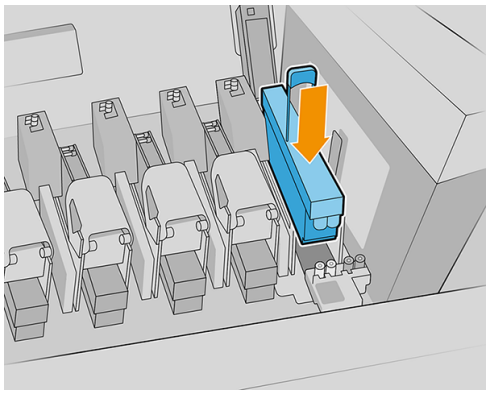


6. Move the carriage over the cleaning roll. Wipe the line sensors with a new cotton swab provided in the kit, slightly dampened with a general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.



7. Insert the printheads into their slots.

⚠ **CAUTION:** FS50 W/FS60 W only: The carriage, capping station, and printheads must be correctly sealed.



8. FS50 W/FS60 W only: Check again that the movable slot system configuration is correct.
9. Close all covers.
10. Turn on the printer.
11. Wait until the rearm button blinks, then press it.
12. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.
13. In the Internal Print Server, move the scan beam to printing position.
14. In the Internal Print Server, select the **Printhead** app, then tap the ellipsis icon ••• followed by **Replace**.

Replace and calibrate the right printhead cleaning blades

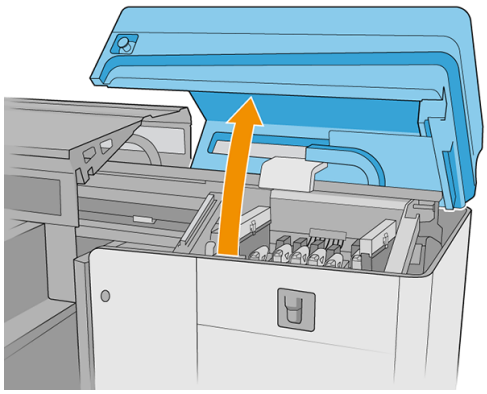
The following steps provide the complete procedure for this topic.

Table 11-20 Warning labels

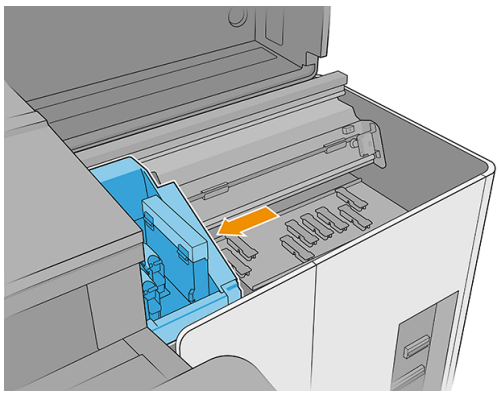
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

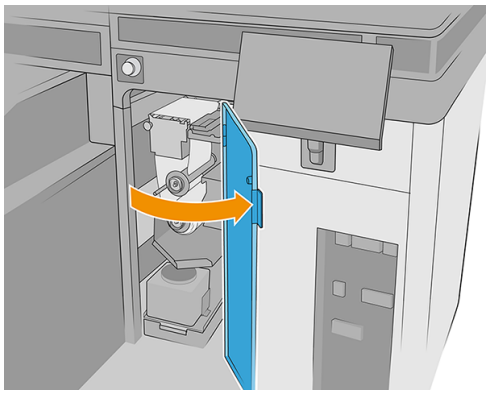
1. Ensure that you have the user maintenance kit, and look in it for the two blades (hard and soft) to be replaced.
2. Ensure that the printer is not printing.
3. Open the carriage cover.



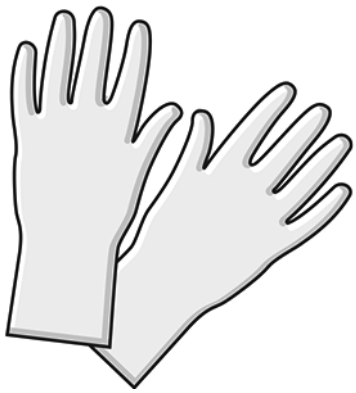
4. Manually move the carriage to the left.



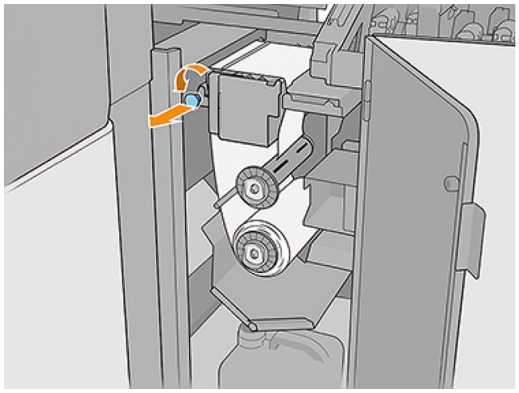
5. Unlock and open the cleaning-roll door.



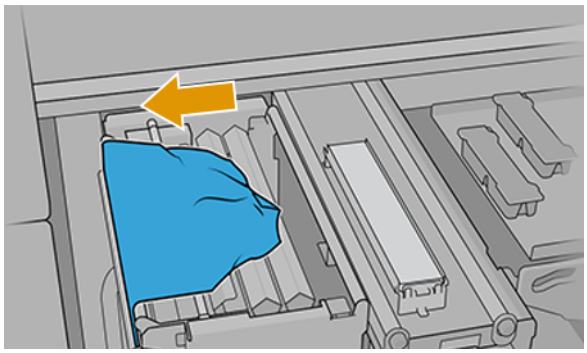
6. Put on gloves to protect your hands.



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

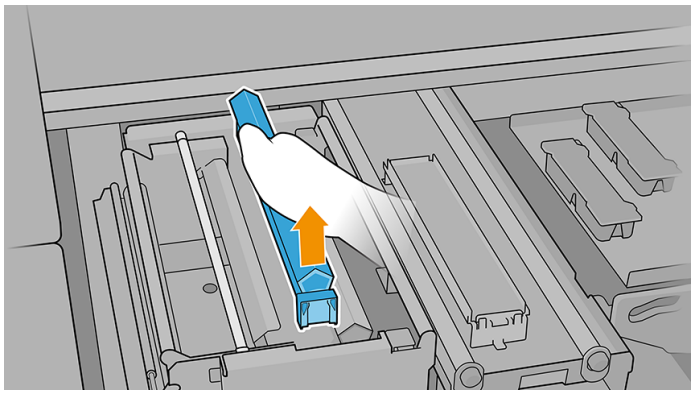


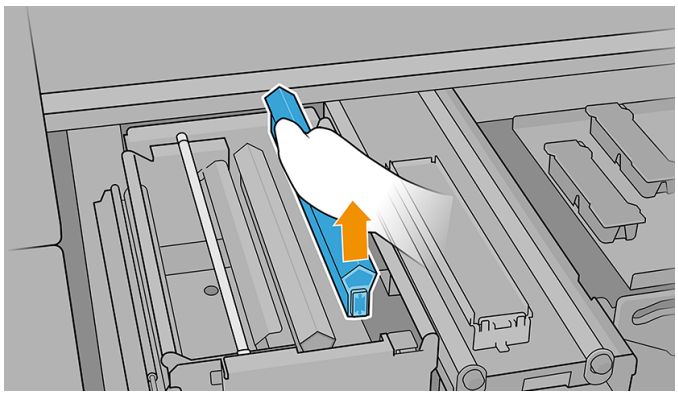
8. Move the printhead cleaning material aside in order to uncover the printhead cleaning blades.



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

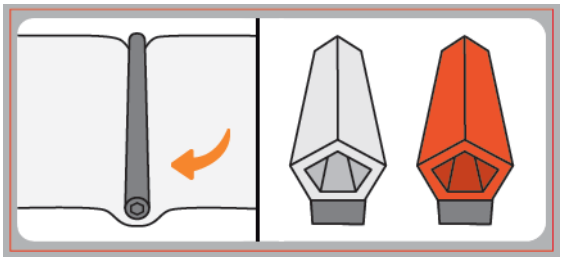
⚠ **CAUTION:** Be careful not to damage the water dispenser nozzle.



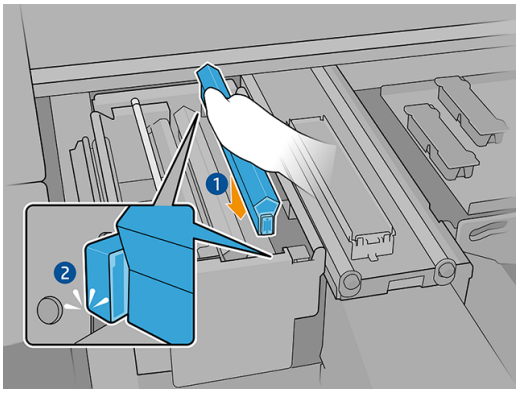


10. Place the new blades into position (see label).

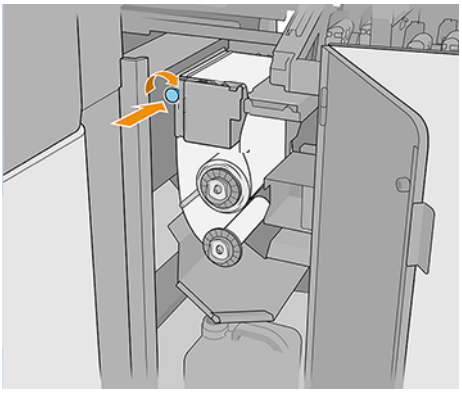
⚠ **CAUTION:** Be careful not to damage the printhead cleaning material.



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 blades.

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.

Clean and grease the substrate-drive transmission gears

The following steps provide the complete procedure for this topic.

Table 11-21 Warning labels

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. To perform this maintenance, you should buy the following grease locally:

   Supplier: MOLYKOTE

   Grease model: G-4500

2. Move the scan axis to the topmost position.
3. Turn off the printer.
4. Run the appropriate diagnostic test and follow the instructions.

Check and clean the printhead cleaning system

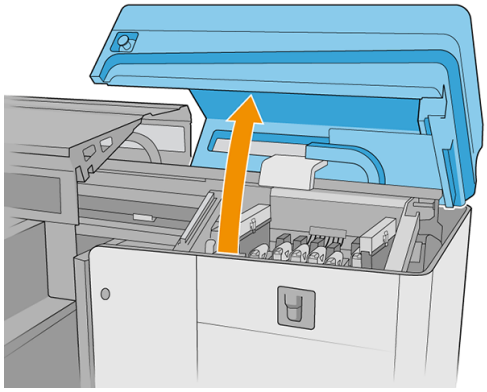
The following steps provide the complete procedure for this topic.

Table 11-22 Warning labels

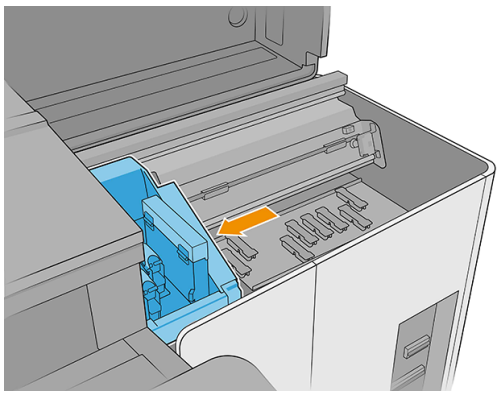
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

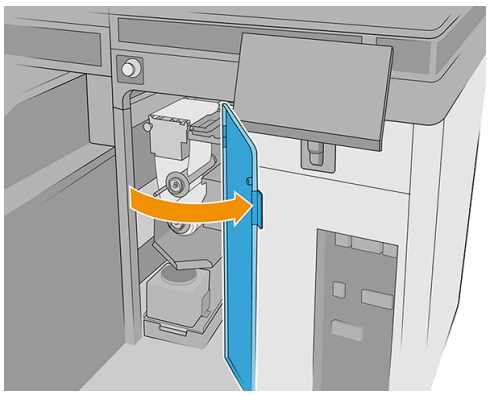
1. Open the carriage cover.



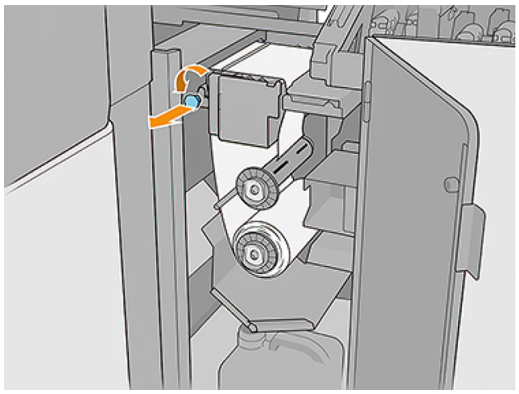
2. Manually move the carriage to the left.



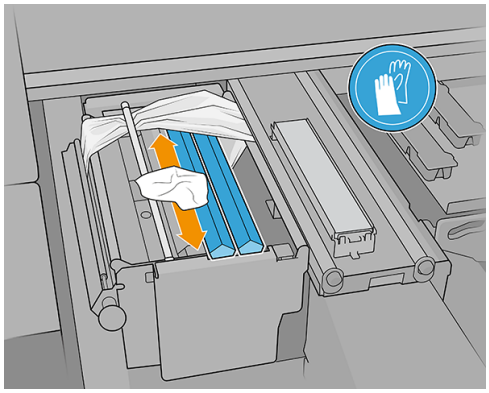
3. Unlock and open the cleaning-roll door.



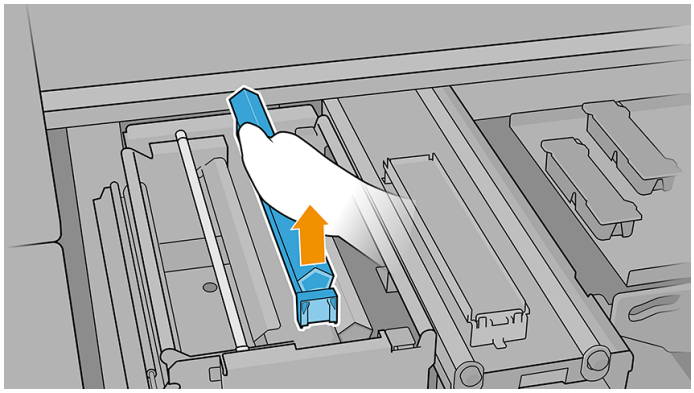
4. Pull the black knob on the upper left and move the pinch mechanism aside.

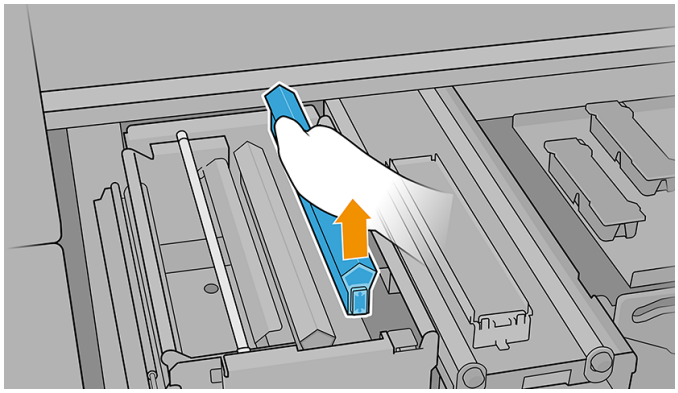


5. Move the printhead cleaning material aside to check that the printhead cleaning blades, diverter, rods, and surfaces are clean.



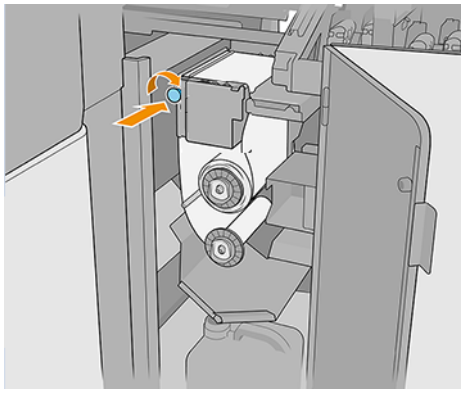
6. Remove the blades to check and clean the draining surface.



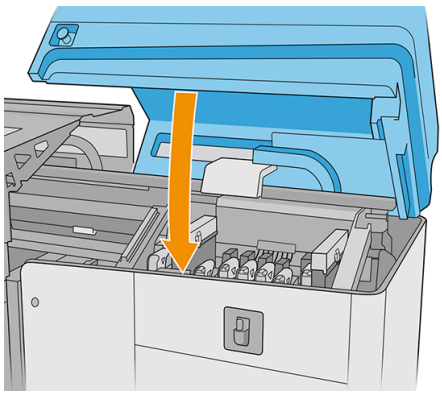


IMPORTANT: If anything is not clean, you can either perform thorough cleaning immediately (see Clean the printhead cleaning system thoroughly on page 188), or wait for the the next weekly maintenance or printhead cleaning roll replacement, whichever comes sooner.

7. Reinstall the blades and the printhead cleaning material.
8. Close the pinch mechanism by pushing in the black knob



9. Close and lock the printhead cleaning roll door.
10. Close the carriage cover.



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

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

Clean the e-box and power-box fan filters, and the carriage cooling fan grid

All of these should be cleaned at the same time.

Clean the e-box fan filter

The following steps provide the complete procedure for this topic.

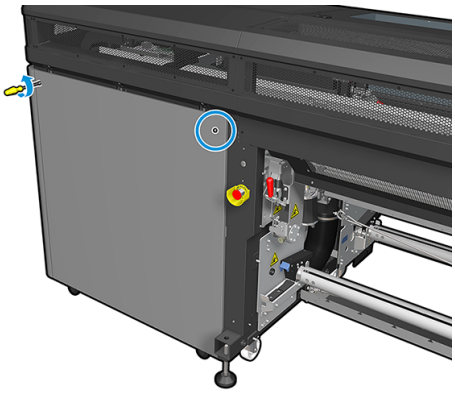
Table 11-23 Warning labels

Moving fan blades	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				
For more safety information, see Safety precautions on page 3				

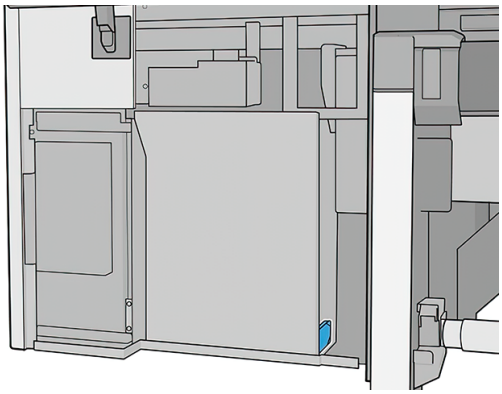
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

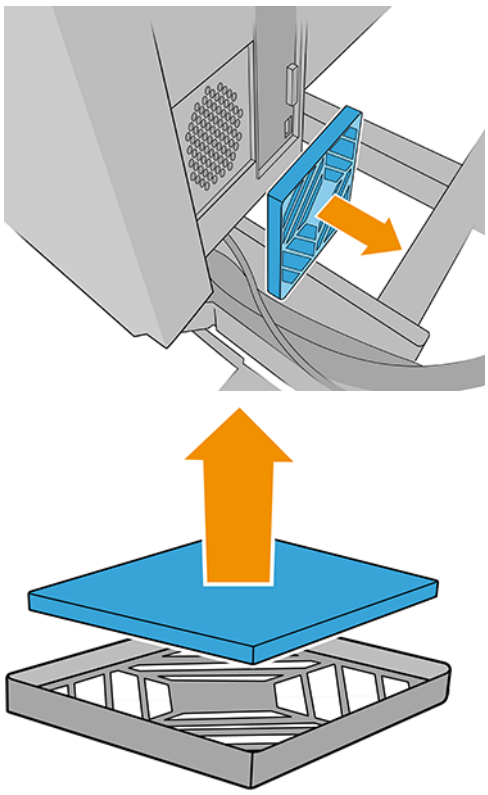
2. Locate the rear right panel assembly.
3. Remove the rear right panel assembly.



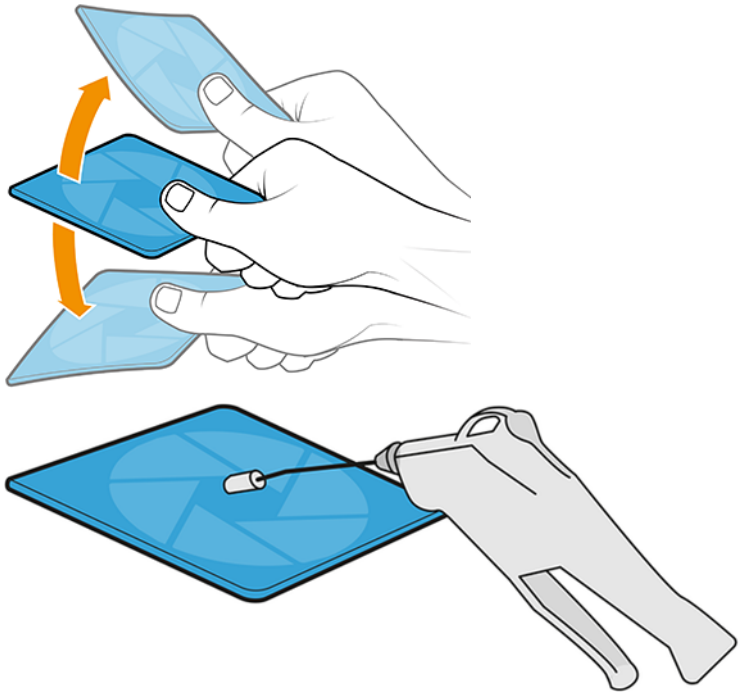
4. Locate the e-box fan filter at the bottom of the e-box.



5. Remove the filter from the e-box and from its frame.

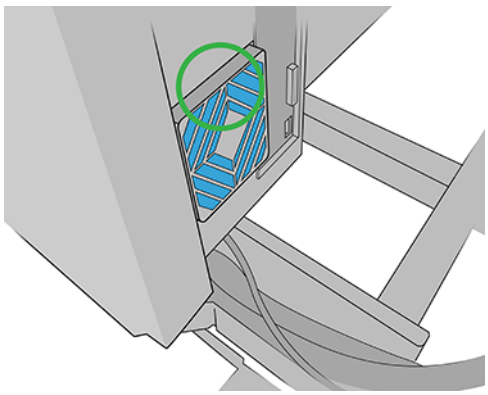


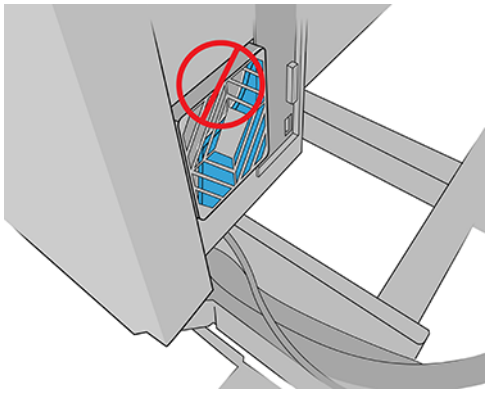
6. Take the fan filter, shake it, and clean it by blowing it with the air gun. Be careful to put it back correctly: it must cover the fan's square surface.



⚠ **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.





Proceed to Clean the power-box fan filter on page 238.

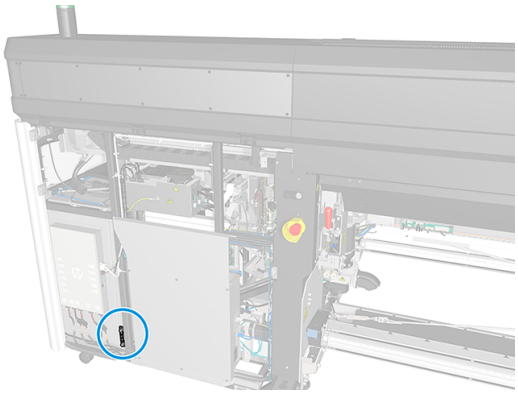
Clean the power-box fan filter

The following steps provide the complete procedure for this topic.

Table 11-24 Warning labels

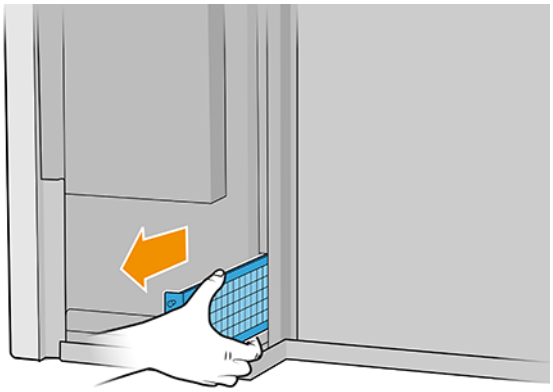
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				
For more safety information, see Safety precautions on page 3				

1. Loosen the two screws that attach the power-box fan filter.

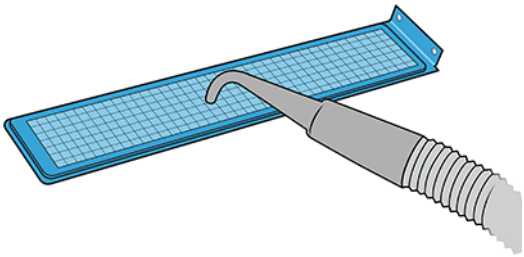


2. Pull out the power-box fan filter.

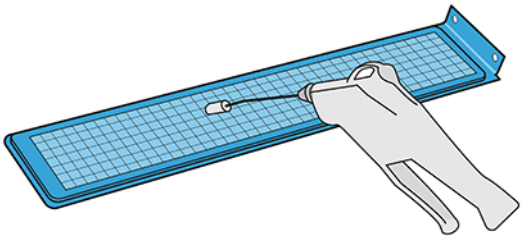
⚠ **CAUTION:** Be careful not to damage the cables when pulling out the fan filter. You may need to move the cables gently out of the way.



3. Clean the filter with a vacuum cleaner or air gun.

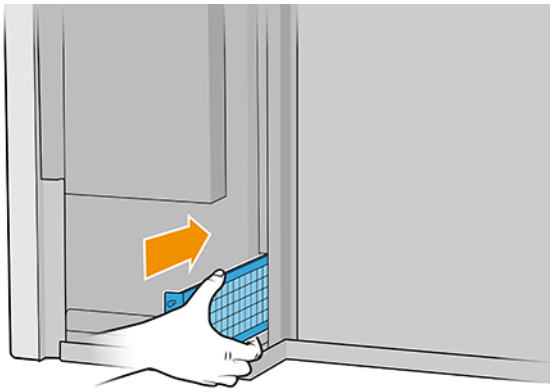


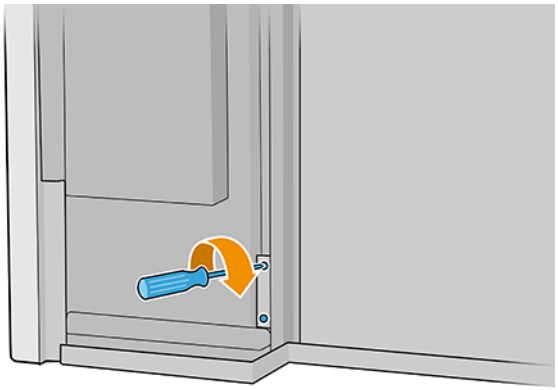
Or:



⚠ **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.

4. Reinstall the filter and tighten the screws.





5. Put back the left cover.

Proceed to Clean the carriage cooling fan grid on page 240.

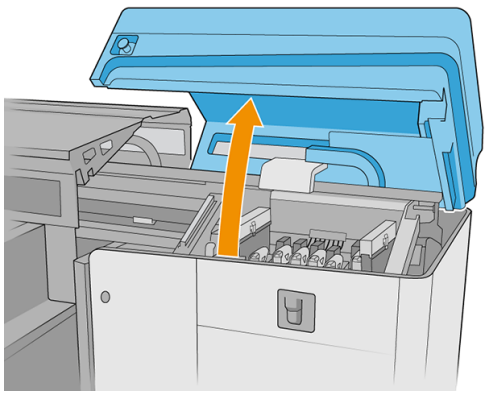
Clean the carriage cooling fan grid

The following steps provide the complete procedure for this topic.

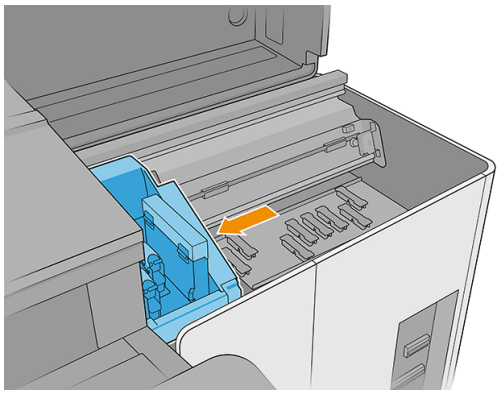
Table 11-25 Warning labels

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				

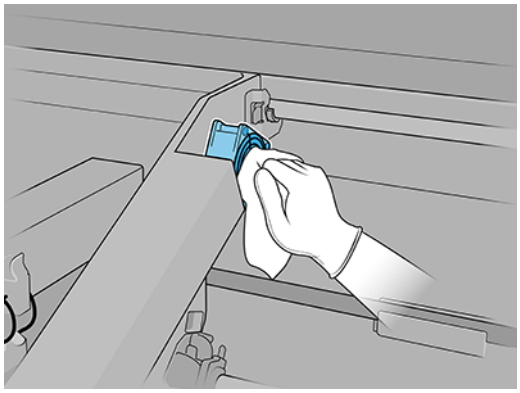
1. Open the carriage cover.



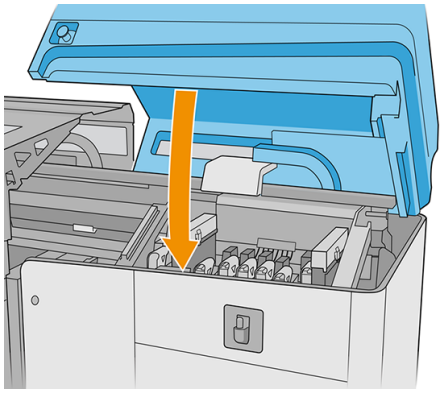
2. Manually move the carriage to the left to access the carriage cooling fan.



3. 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.



4. Ensure that the cleaned parts are completely dry and all vapor has totally evaporated.
5. Close the carriage cover.



6. Turn on the printer.
7. Wait until the rearm button blinks, then press it.
8. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Replace the oiling felts

The following steps provide the complete procedure for this topic.

Table 11-26 Warning labels

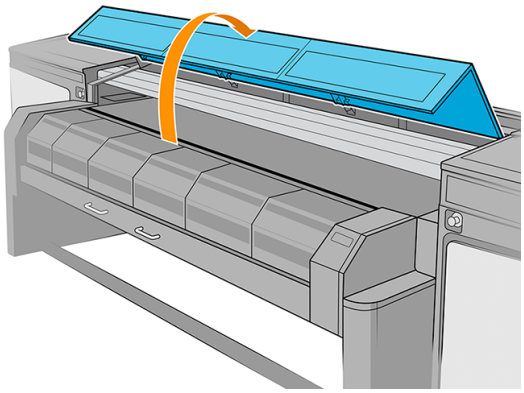
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard	Risk of cutting
					

For more safety information, see Safety precautions on page 3

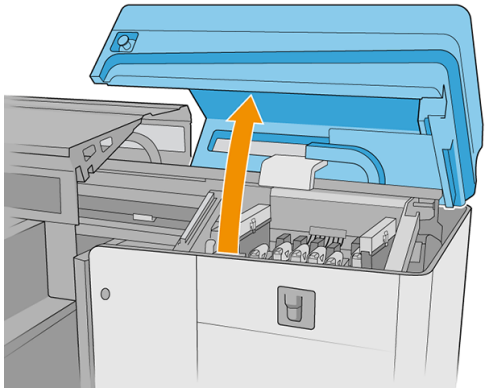
1. Ensure that you have the user maintenance kit, which includes two right oiling felts, two left oiling felts, and the required tools (Torx 8 and 3 mm Allen key) to remove and replace the screws holding them to the carriage and cloths.
2. You are recommended to wear gloves when manipulating oiled parts (but not when fastening/unfastening screws).
3. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

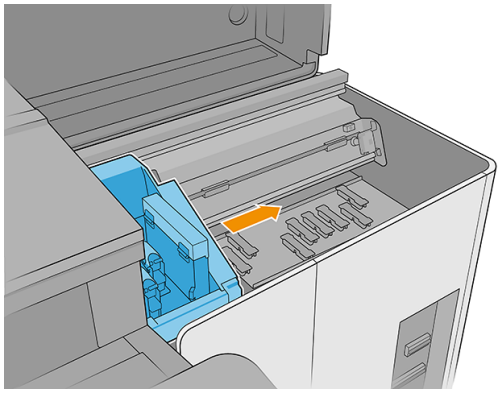
4. Open the window.



5. Open the carriage cover.

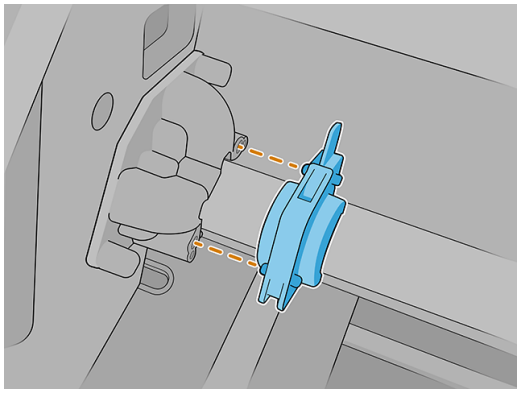


6. Move the carriage manually to the right until the left oiling felts are accessible.

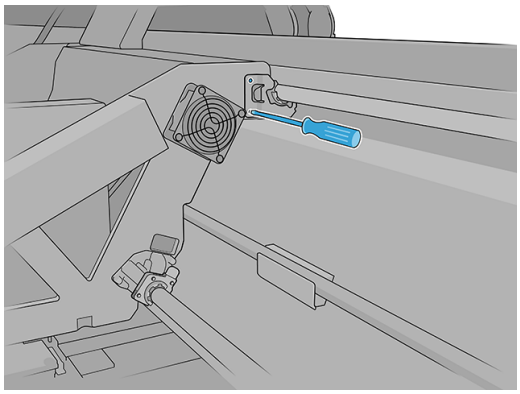


7. Remove the screws from the left felts, using the Torx 8 and 3 mm Allen key.

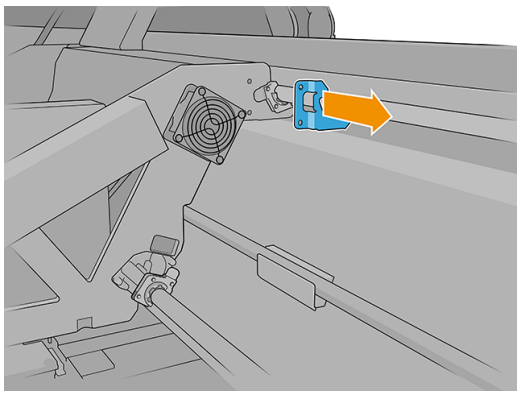
IMPORTANT: Take care not to lose the screws once removed.



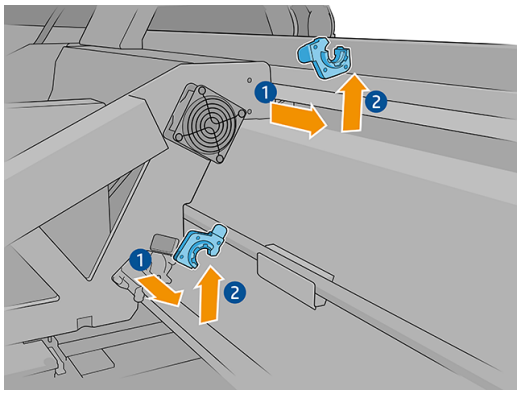
8. Unscrew the metal part covering the rear felt.



9. Remove and keep the metal part.

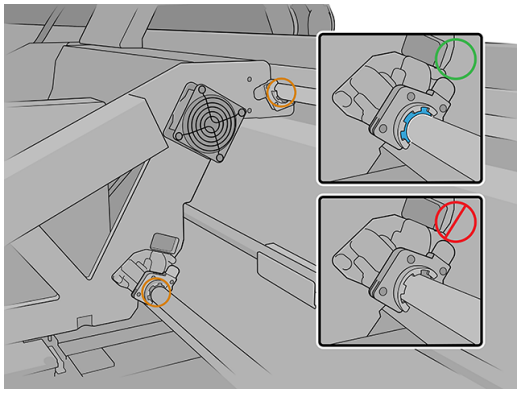


10. Move the felts to be replaced a few millimeters away from the carriage and then pull them out of the scan-axis rod (turning them clockwise or counterclockwise will help). Dispose of the used/dirty felts as waste material.

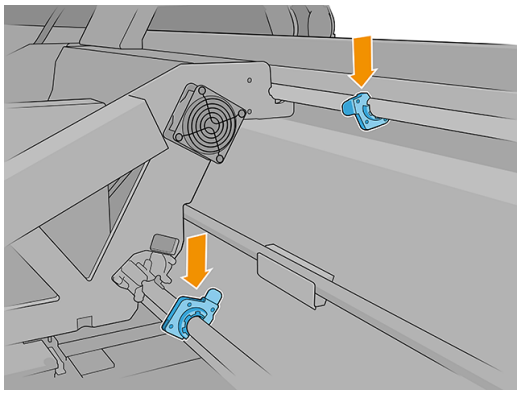


11. Take the two clean left oiling felts from the user maintenance kit and install them.

    Once installed, the blue plastic part in the felt should be outwards (not inwards).

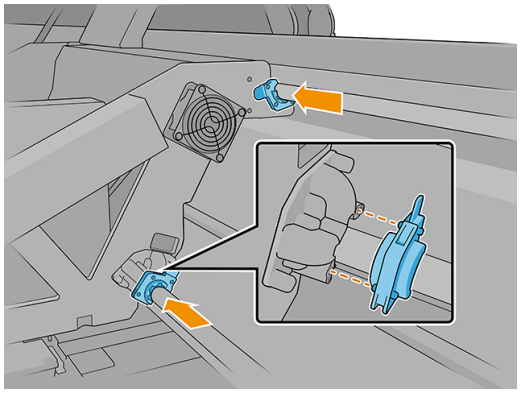


12. Attach the felts to each rod.



13. Slide the felts towards the carriage.

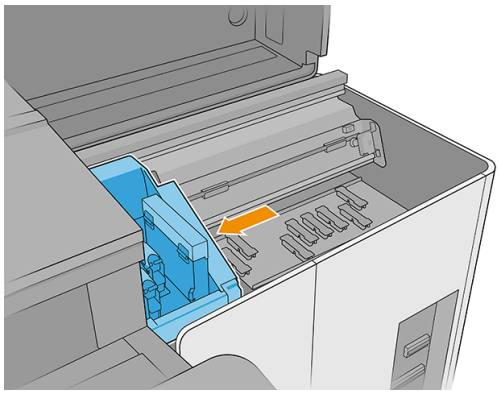
The cross-shaped features in the felt housing shown below have to go into the holes provided in the carriage. For the rear felt, two pins in the carriage should pass through holes in the felt housing.



14. Replace the screws previously removed to attach the felts to the carriage.

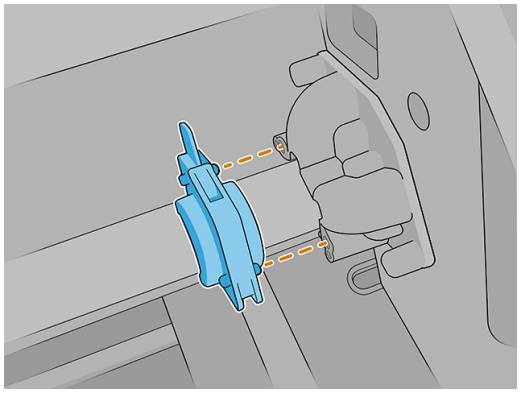
NOTE: For the rear felt, replace the metal part previously removed before replacing the screws.

15. Move the carriage manually to the left until the right oiling felts are accessible.

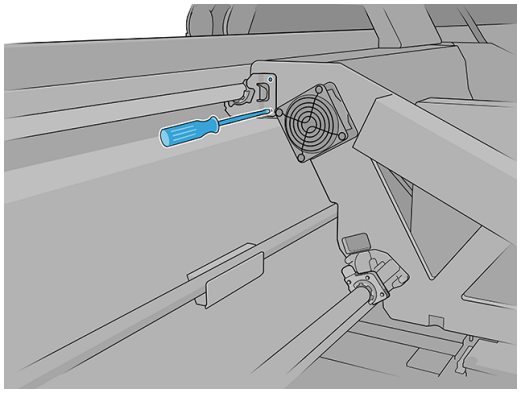


16. Remove the screws from the right felts, using the Torx 8 and 3 mm Allen key.

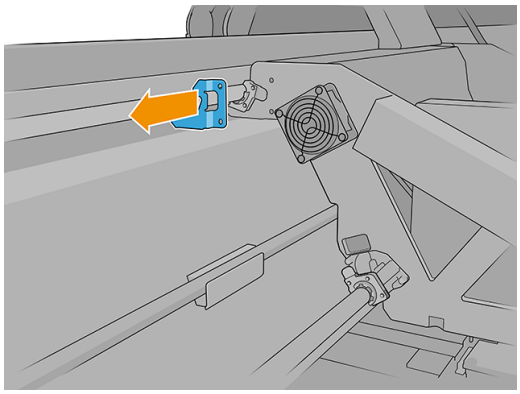
IMPORTANT: Take care not to lose the screws once removed.



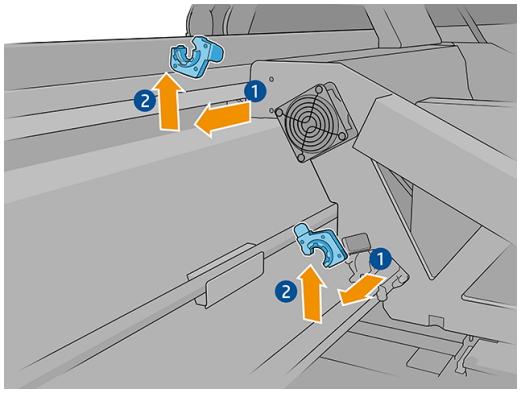
17. Unscrew the metal part covering the rear felt.



18. Remove and keep the metal part.

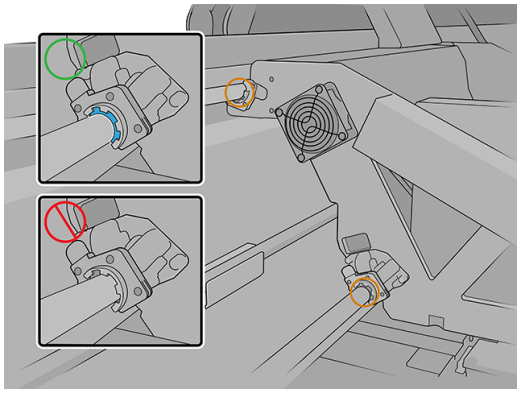


19. Move the felts to be replaced a few millimeters away from the carriage and then pull them out of the scan-axis rod (turning them clockwise or counterclockwise will help). Dispose of the used/dirty felts as waste material.

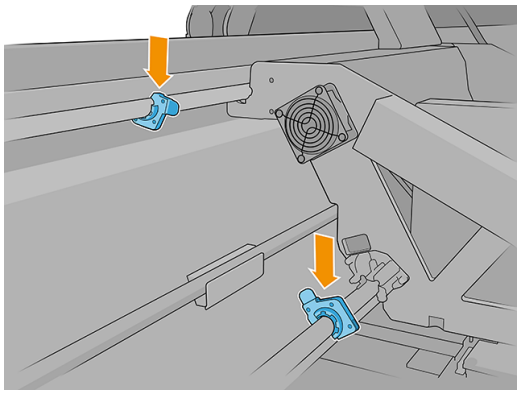


20. Take the two clean right oiling felts from the user maintenance kit and install them.

    Once installed, the blue plastic part in the felt should be outwards (not inwards).

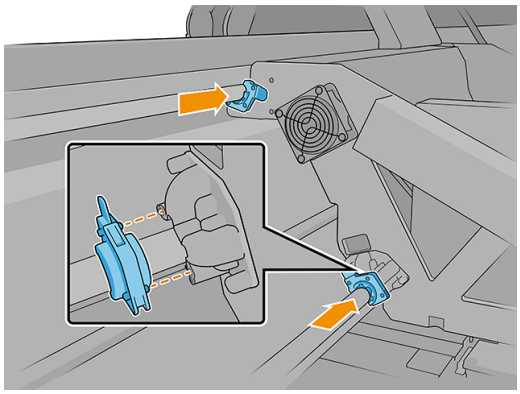


21. Attach the felts to each rod.



22. Slide the felts towards the carriage.

    The cross-shaped features in the felt housing shown below have to go into the holes provided in the carriage. For the rear felt, two pins in the carriage should pass through holes in the felt housing.



23. Replace the screws previously removed to attach the felts to the carriage.

> NOTE: For the rear felt, replace the metal part previously removed before replacing the screws.

24. Close the carriage cover and the window.
25. Turn on the printer.
26. Wait until the rearm button blinks, then press it.
27. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Clean and lubricate the scan-axis rods

The following steps provide the complete procedure for this topic.

Table 11-27 Warning labels

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

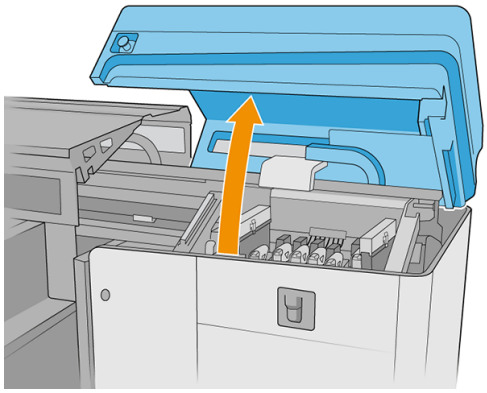
For more safety information, see Safety precautions on page 3

1. Turn off the printer.

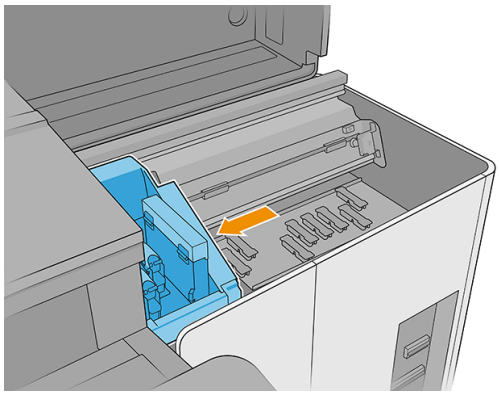
IMPORTANT: Wait for the curing and drying fans to stop spinning.

2. HP recommends wearing gloves when manipulating oiled parts (though not for fastening or unfastening screws).

3. Open the carriage cover to access the scan-axis rods on the right-hand side of the printer.

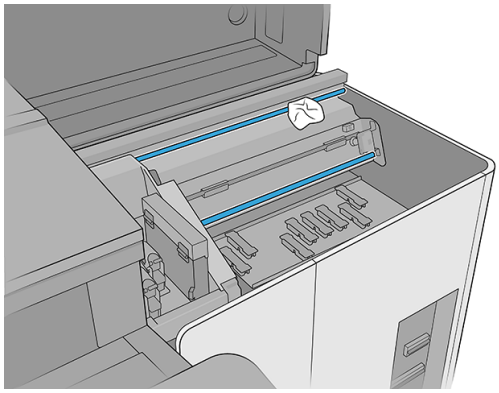


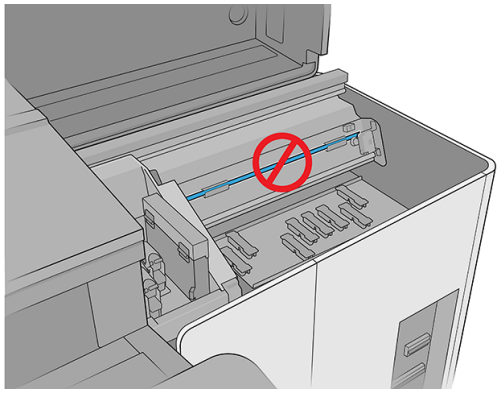
4. Move the carriage manually to the left to access the rightmost part of the rods.



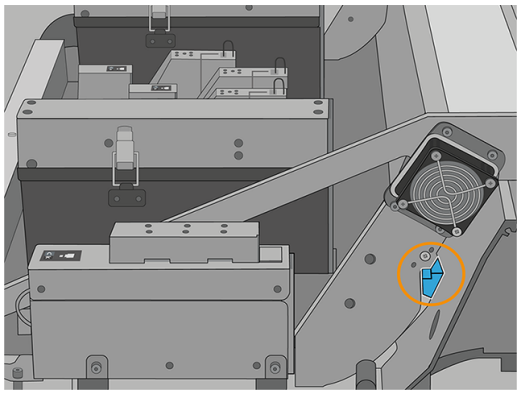
5. You will see a ring of dust on the top and bottom rods. Clean the rods with a lint-free cloth dampened with distilled water or with general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.

⚠ **CAUTION:** When cleaning the rods, avoid cutting yourself with the encoder strip, or breaking it.

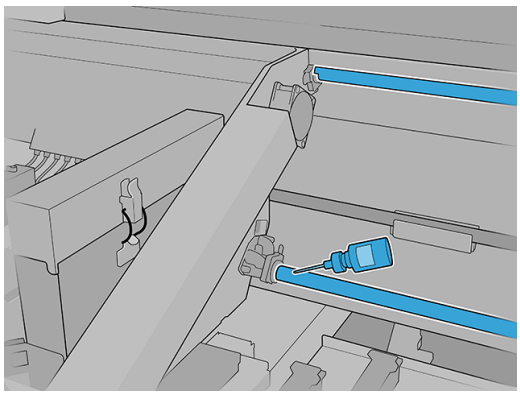




6. Clean any debris located in the carriage plates (especially in the right-hand plate) with a cotton swab, to prevent encoder malfunction.

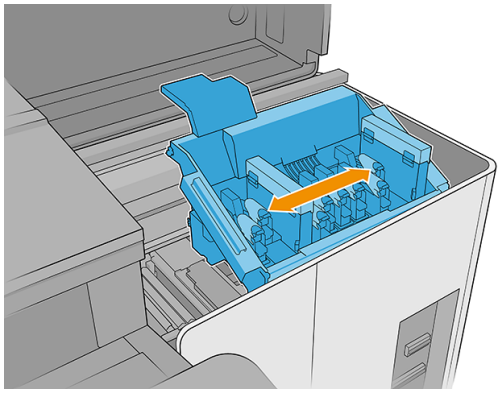


7. Allow the rods to dry, then lubricate them with a few drops of the lubricant provided in the user maintenance kit.

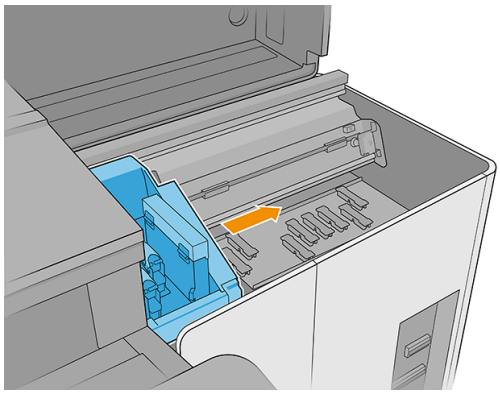


8. Turn on the printer, then wait until the rearm button blinks, and press it.
9. Start the appropriate diagnostic test. If the test fails, apply steps 10 to 13. If successful, skip to step 14.

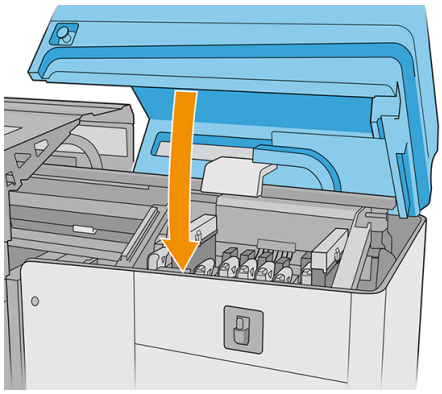
10. Turn off the printer, and wait for the curing and drying fans to stop spinning.
11. Move the carriage from side to side to spread the lubricant evenly over the rods.



12. Move the carriage back to the right.

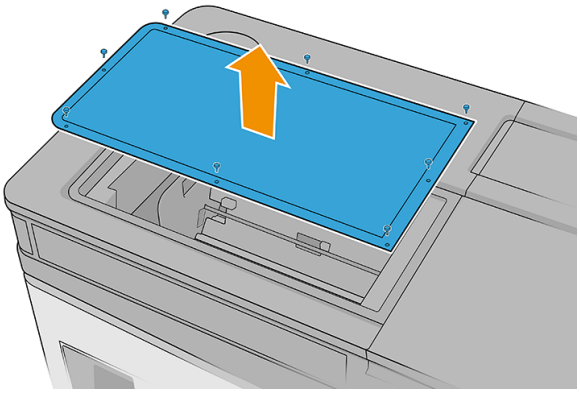


13. Close the carriage cover.



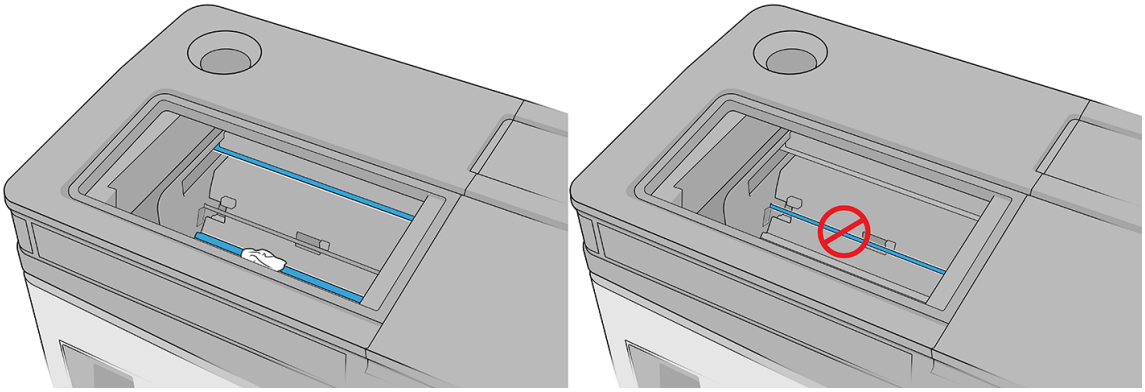
14. Remove the top left cover to access the scan-axis rods on the left-hand side of the printer.

⚠ **CAUTION:** Take care not to damage the encoder strip.



15. You will see a ring of dust on the top and bottom rods. Clean the rods with a lint-free cloth dampened with distilled water or with general-purpose industrial cleaner (such as Simple Green). Remove any remaining soap foam with a dry cloth.

⚠ CAUTION: When cleaning the rods, avoid cutting yourself with the encoder strip, or breaking it.



16. Put back the top left cover.
17. Turn on the printer.
18. Wait until the rearm button blinks, then press it.
19. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

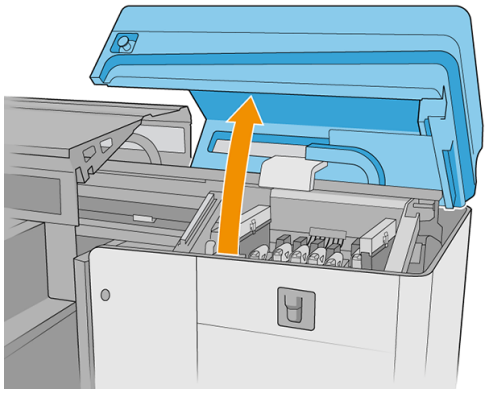
Clean and grease the printhead latches

The following steps provide the complete procedure for this topic.

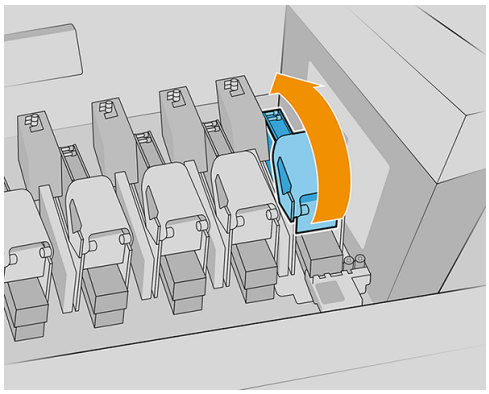
Table 11-28 **Warning labels**

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				

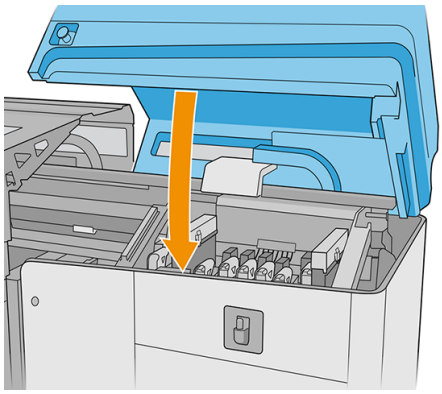
1. Turn off the printer.
2. Open the carriage cover.



3. Release the latch that secures a printhead, and lift it.



4. Clean the latch.
5. Use a cotton swab dampened with lubricant to lubricate the latch hinges. Use a cotton swab and the lubricant provided in the maintenance kit.
6. Repeat for the other printhead latches.
7. Close the carriage cover.



8. Turn on the printer.

9. Wait until the rearm button blinks, then press it.
10. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Clean the curing perforated plate and the curing fans

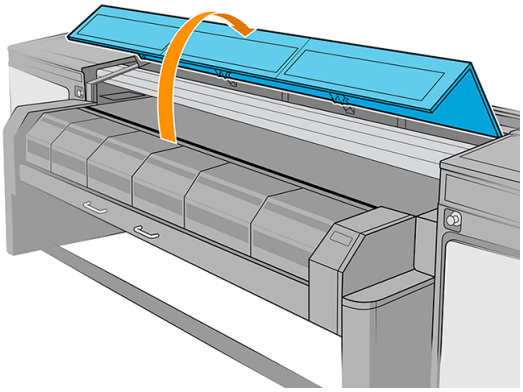
The following steps provide the complete procedure for this topic.

Table 11-29 Warning labels

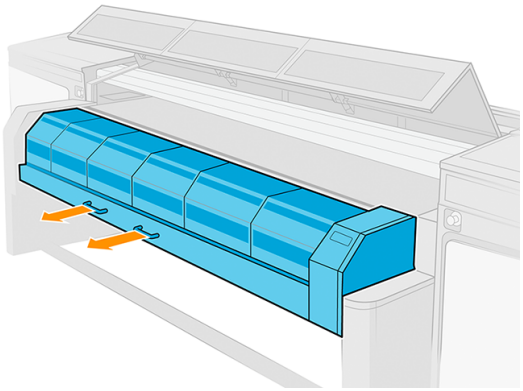
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

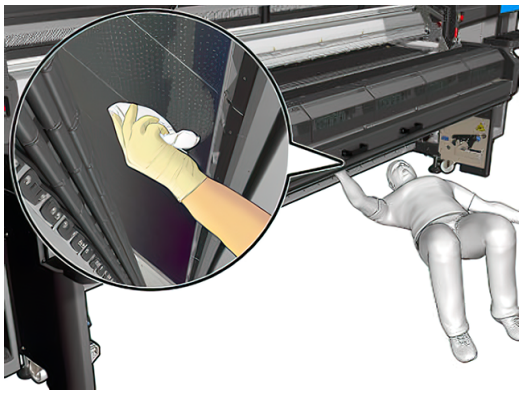
1. Turn off the printer.
2. Open the window.



3. Pull out the curing module.

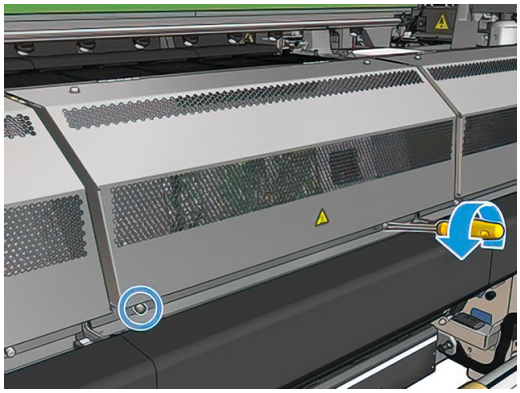


4. Lie on the floor in order to clean underneath the curing module.

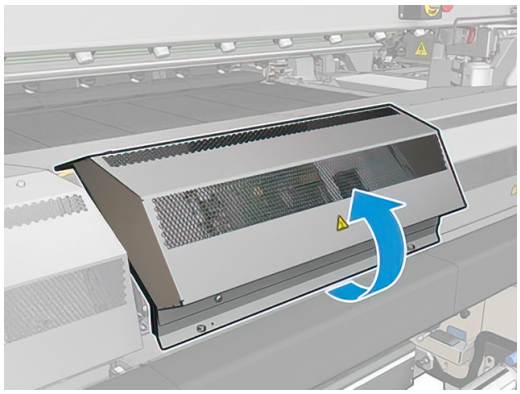


IMPORTANT: Wait for the curing module to cool down to avoid burnings.

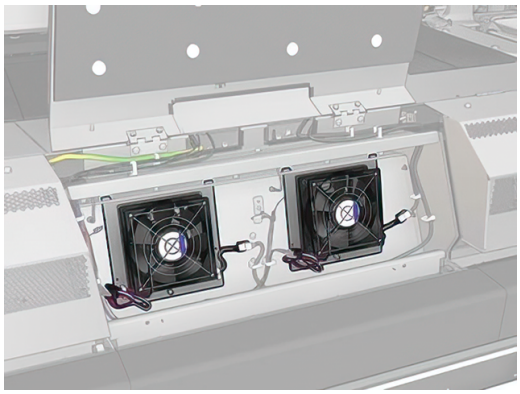
5. Use a lint-free cloth dampened in a general-purpose industrial cleaner (such as Simple Green) to remove the ink completely from the plate.
6. Use a brush to remove ink from the holes.
7. Wait for the cleaner to evaporate.
8. Close the curing module and the window.
9. Use a screwdriver to remove the two gray screws from the curing-fans cover.



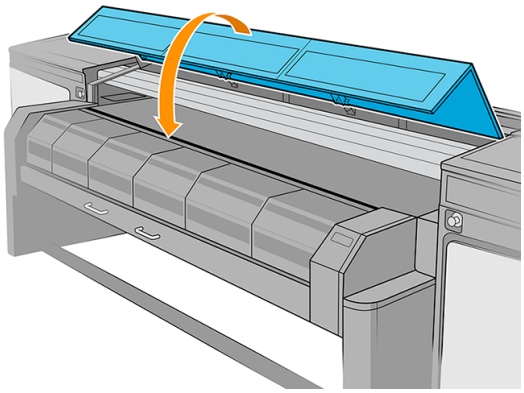
10. Lift the curing-fans cover.



11. Clean the curing fans.



12. Close the curing-fans cover.
13. Fasten the cover with the two screws, and tighten them with a screwdriver.
14. Close the window.



15. Turn on the printer.
16. Wait until the rearm button blinks, then press it.
17. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Clean and grease the printhead primers

The following steps provide the complete procedure for this topic.

Table 11-30 Warning labels

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

Table 11-30 Warning labels (continued)

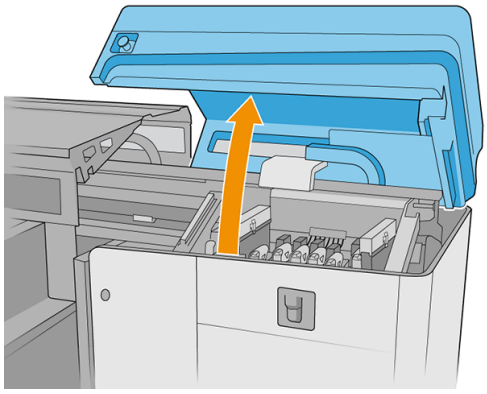
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
For more safety information, see Safety precautions on page 3				

NOTE: Perform this operation when the system error 0088-0001-0Y41 appears.

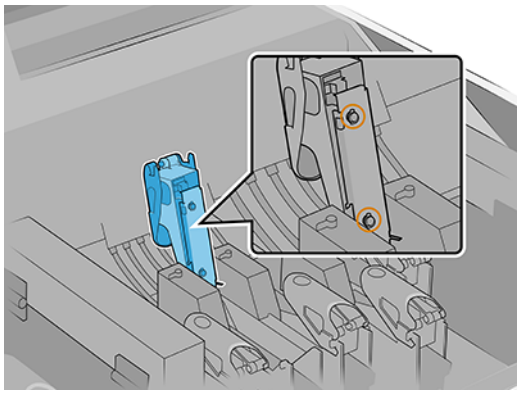
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

2. Open the carriage cover.

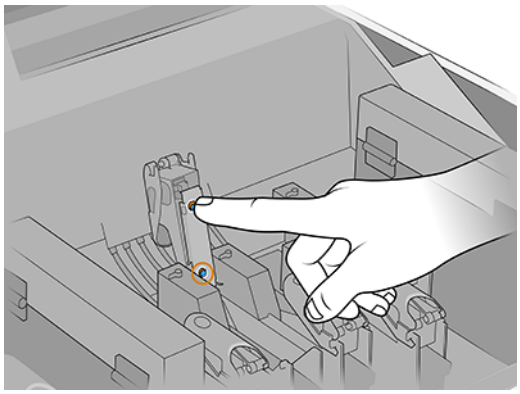


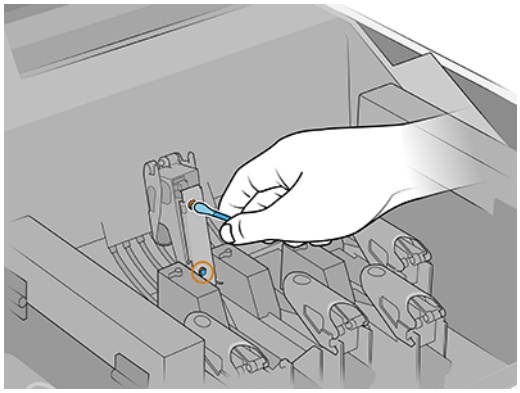
3. After lifting a printhead cover, two 'O' rings can be seen that seal the joints between the printhead cover and printhead.



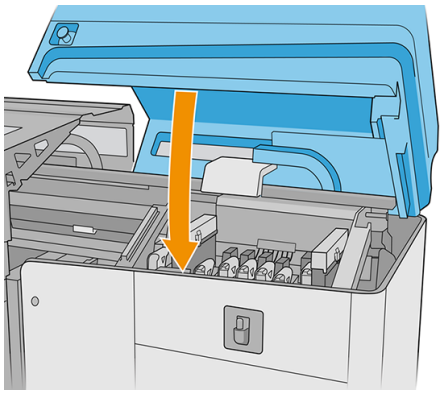
4. Clean the 'O' rings. Then, use a cotton swab dampened with lubricant to lubricate the black rubber in the ‘O’ rings to improve their performance. Use a cotton swab and the lubricant provided in the

maintenance kit. The lubricant should be applied to the black rubber part only. If lubricant gets into the central hole, remove it with a thin wire or similar tool.





5. Close the printhead cover.
6. Repeat for the other printheads.
7. Close the carriage cover.



8. Turn on the printer.
9. Wait until the rearm button blinks, then press it.
10. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Clean the FI towers, including the CK storage box and white-printhead FI tower

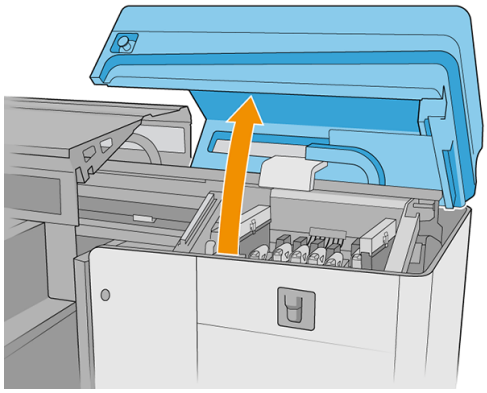
The FI tower is the structure into which the printhead is inserted, and through which the ink arrives at the printhead.

Table 11-31 Warning labels

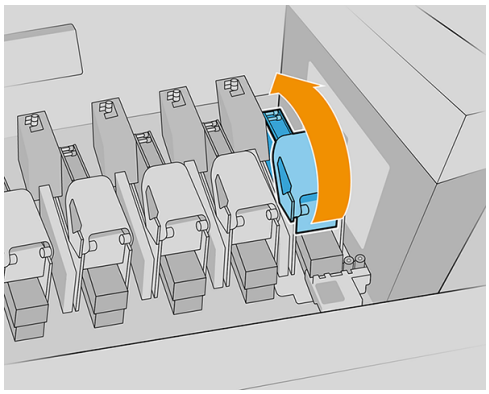
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

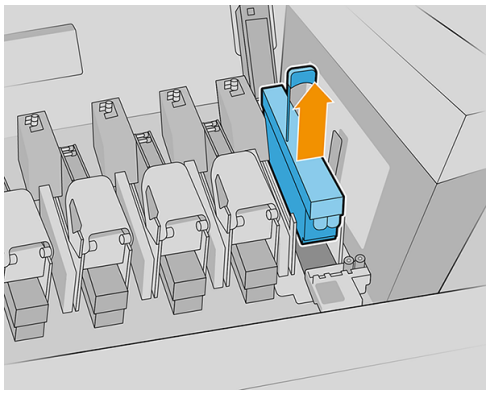
1. Open the carriage cover.



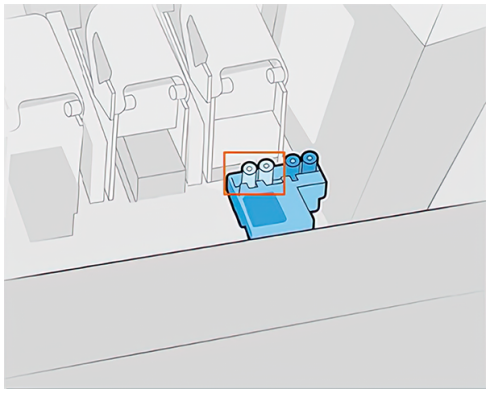
2. Release the latch that secures printhead (7) and lift it.



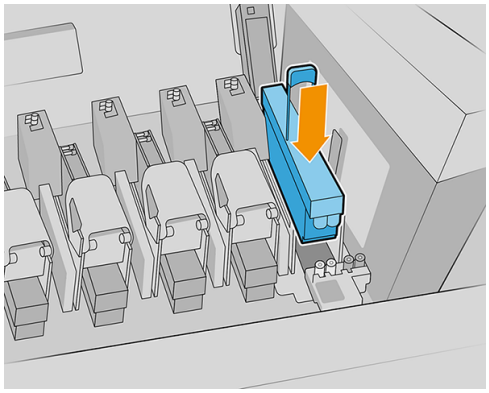
3. Using the blue handle, gently pull upwards to disconnect and extract the printhead from the carriage.



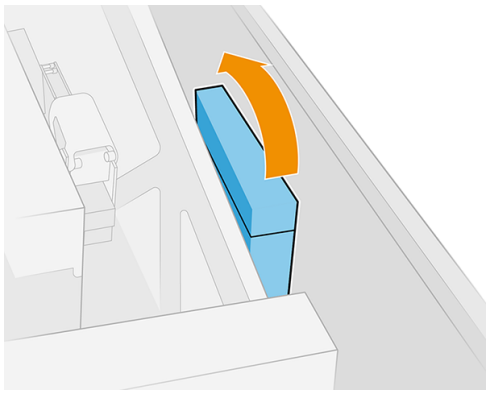
4. Check whether the tower has a lot of ink on it. If so, clean it with a lint-free cloth.



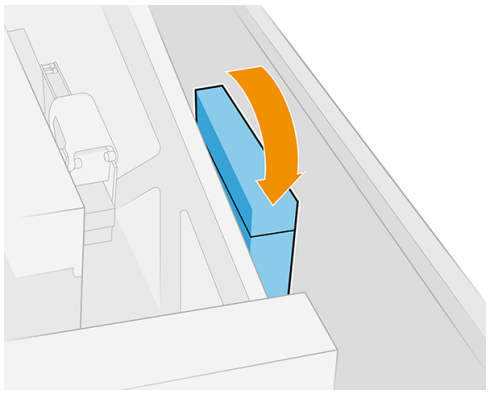
5. Insert the printhead in slot (7) and close the latch.



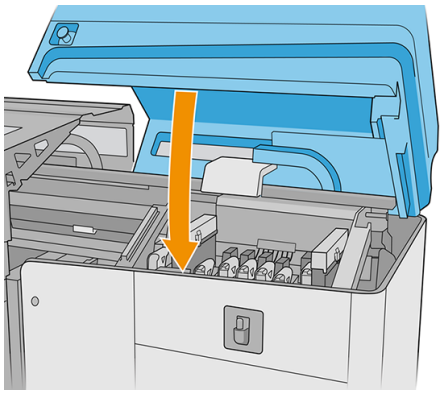
6. Open the storage box of the CK printhead. If there is a CK printhead inside, remove it.



7. Check the storage box and clean off any ink remaining on it.
8. Close the storage box.



9. Close the carriage cover.



Check and replace a service-station cap

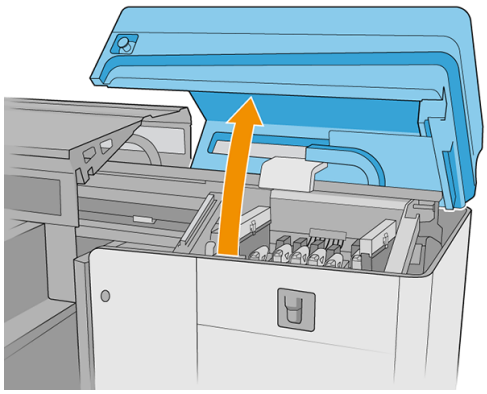
The following steps provide the complete procedure for this topic.

Table 11-32 Warning labels

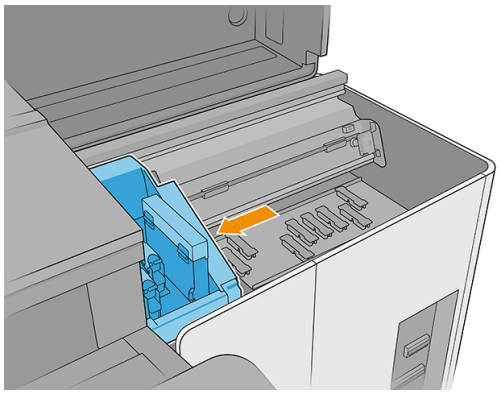
Risk of burns	Crush hazard	Risk of trapped fingers	Hazardous moving part	Electric shock hazard
				

For more safety information, see Safety precautions on page 3

1. Open the carriage cover.

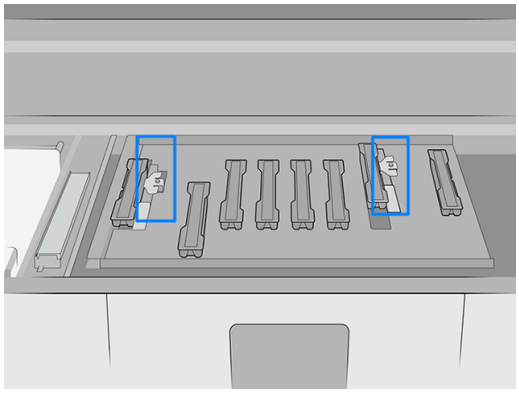


2. Move the carriage manually to the left in order to access the service-station caps.

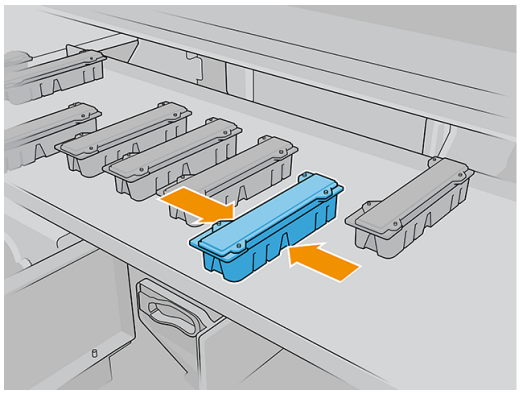


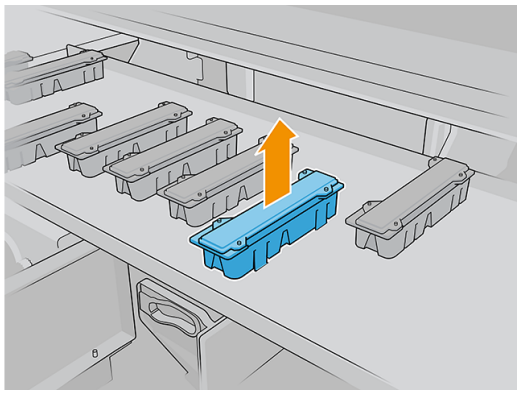
3. HP Latex FS50 W/FS60 W only: If you are going to remove the caps of slots 1 and 7, move the switches to the intermediate position (B).

⚠ CAUTION: Take note of the configuration of the capping system. At the end of the process you will be required to restore the system to its initial configuration.



4. Remove the service-station cap by pressing on the four lateral fixings (two each side), and pulling up.



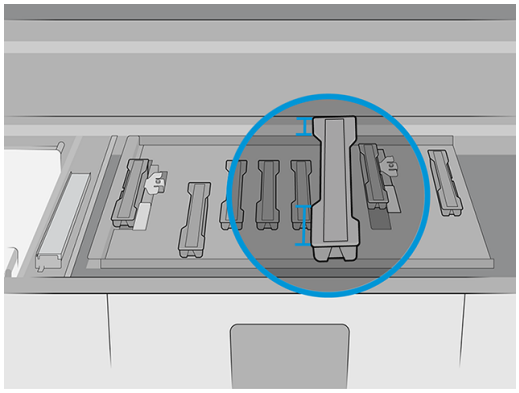


5. Make a visual check of the service-station cap. If you see that it is damaged or deformed, discard it and fetch a new one.

6. Put back the old service-station cap or install a new one, as required.

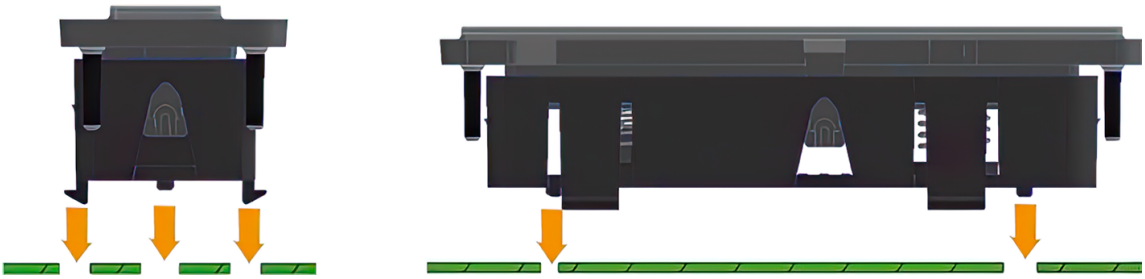
   Correctly orient the cap in the capping station.

NOTE: The cap is asymmetrical.

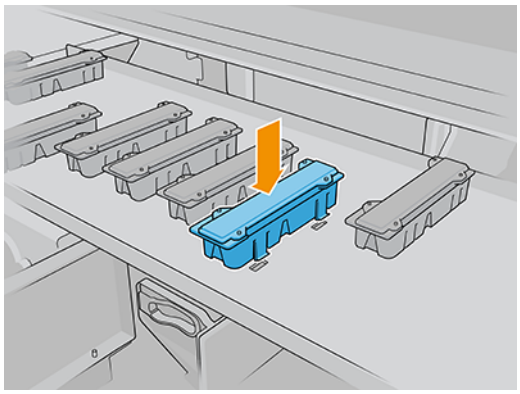


7. Locate the pins under the cap assembly and align them with the holes.

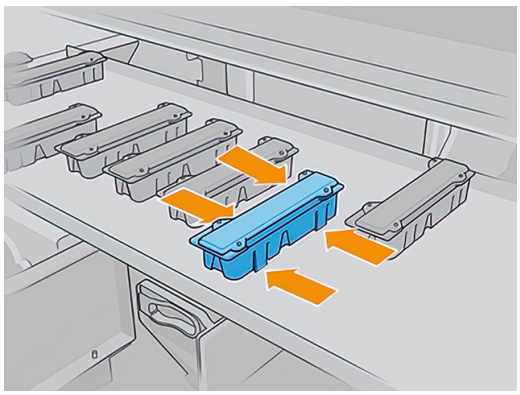
IMPORTANT: Do not tilt the cap assembly.



8. Lower the cap into position.



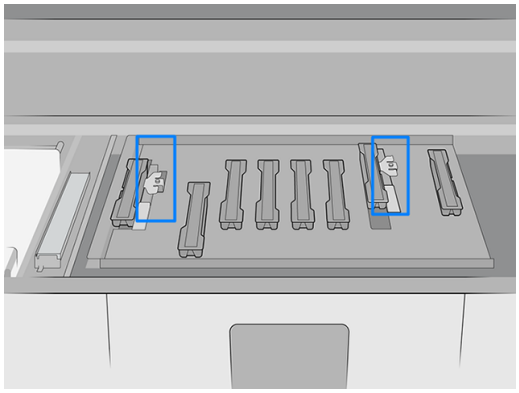
9. Once the cap touches the printer, without tilting, press the sides of the four snap-fit features and press lightly downwards to finish insertion



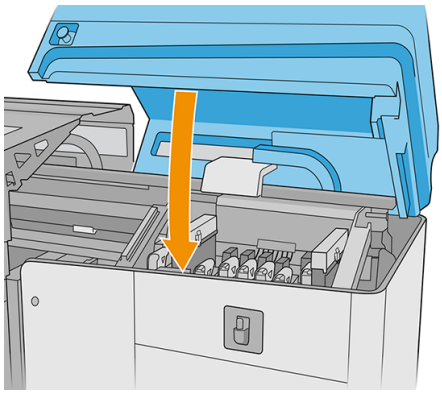
IMPORTANT: When it is in place, ensure that the rubber surface that covers the service-station cap is correctly located on the four pins.

10. HP Latex FS50 W/FS60 W only: If you removed the caps of slots 1 and 7, move the switches to their original positions.

CAUTION: Movable slot configuration and capping configuration must be aligned, otherwise printhead health could be affected.



11. Close the carriage cover.



Check the correct behavior of the residual current devices (RCD)

The following steps provide the complete procedure for this topic.

Table 11-33 **Warning labels**

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 at **Idle** status and rearmed.
2. Identify the RCDs in the switches panel.

3. Locate the test button on the RCD.



4. Push the test button on every RCD. Each switch should go down, disconnecting the power to the subsystem that it manages (such as the vacuum pumps, or curing and drying).

IMPORTANT: If any RCD does not disconnect, contact your service representative.

5. Turn on the RCD switches to restore power to each subsystem.
6. Turn on the printer.

Purge the ink from the MSS box (FS50 W/FS60 W only)

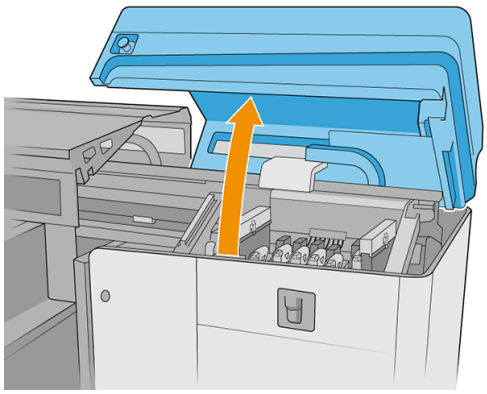
Table 11-34 Warning labels

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				

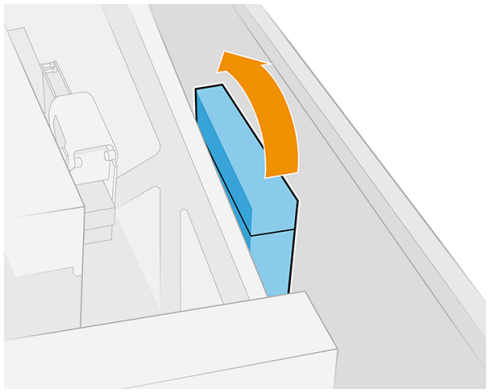
1. Turn off the printer.

IMPORTANT: Before continuing, wait for the curing and drying fans to stop spinning.

2. Open the carriage cover.

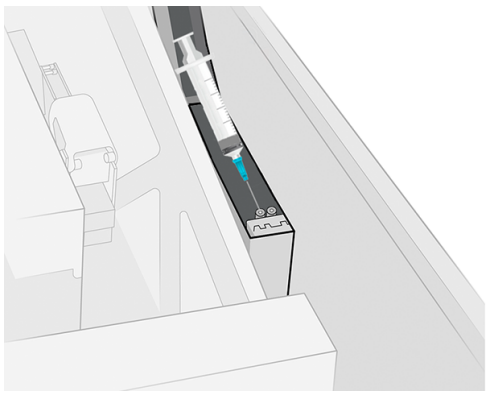


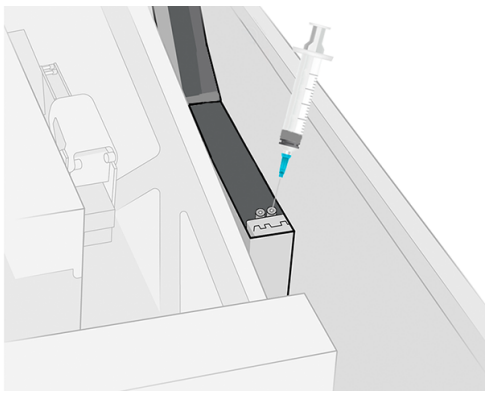
3. Open the CK storage box.



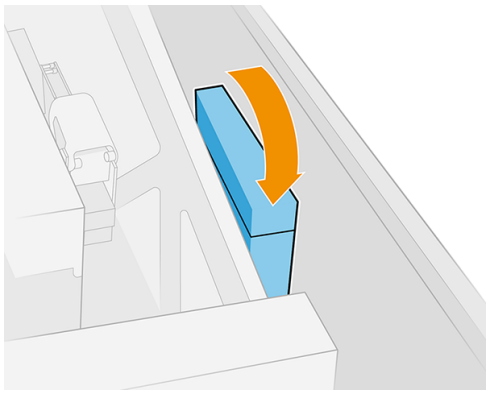
4. HP recommends wearing gloves when manipulating oiled parts (but not when fastening/unfastening screws).

5. Use two syringes, one for each purging slot. Fill each one with approximately 10 ml of ink.

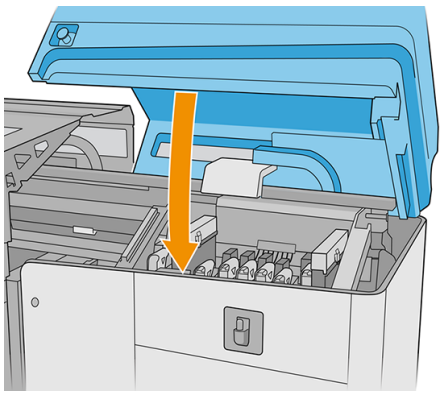




6. Close the storage box.



7. Close the carriage cover.



8. Turn on the printer.
9. Wait until the rearm button blinks, then press it.
10. Wait until the printer status in the Internal Print Server changes from **Booting** to **Idle**.

Check and empty the condensation collector bottle

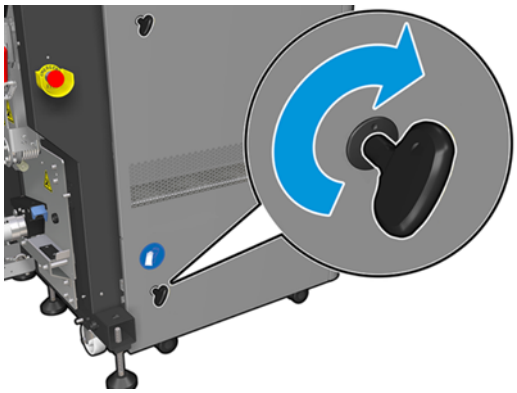
The condensation collector bottle is stored behind the right cover at the rear of the printer.

TIP: You are recommended to wear gloves for this operation.

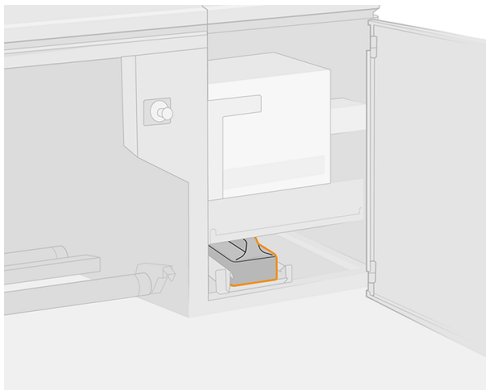
NOTE: Ensure the printer is not printing.

The bottle should be emptied before it is full. You should check the level in the bottle every time you change the printhead cleaning roll, and empty it if it is half full (or more).

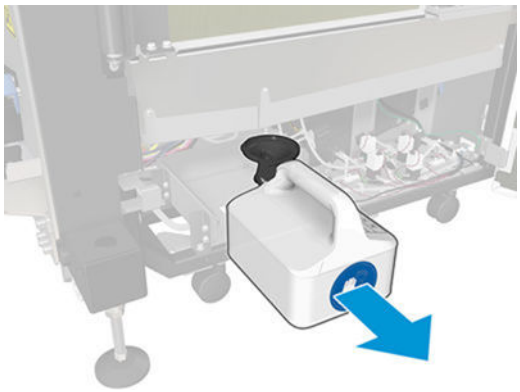
1. To remove the bottle, first open the two locks on the left with the key.



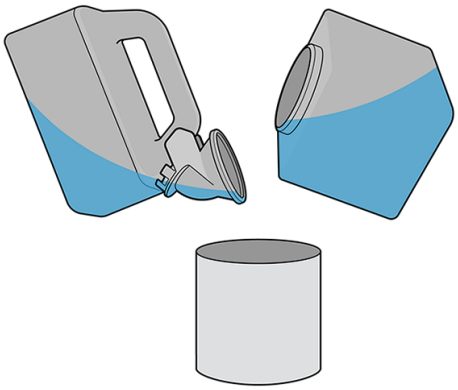
2. Open the door and locate the condensation collector bottle on the bottom.



3. Remove the bottle.



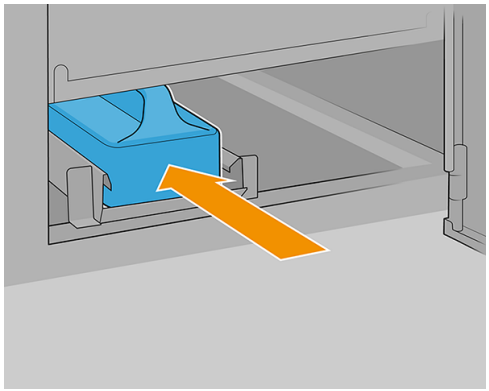
4. Empty the bottle.



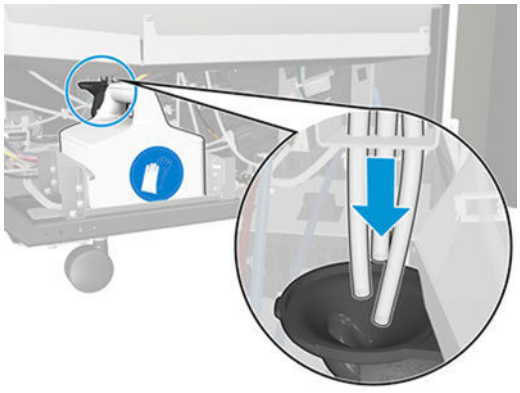
NOTE: Empty the bottle if it is at least half full.

NOTE: The condensates are a mixture of ink additives and water. Dispose of the condensates according to local regulations. The waste-profile datasheet contains the required information for an adequate disposal; it can be found in the HP Latex Knowledge Center: https://hplatexknowledgecenter.com/applications/wasteprofiles.

5. Put back the empty bottle.



6. Take care that the mouth of the bottle is well positioned to receive the liquid falling from above.



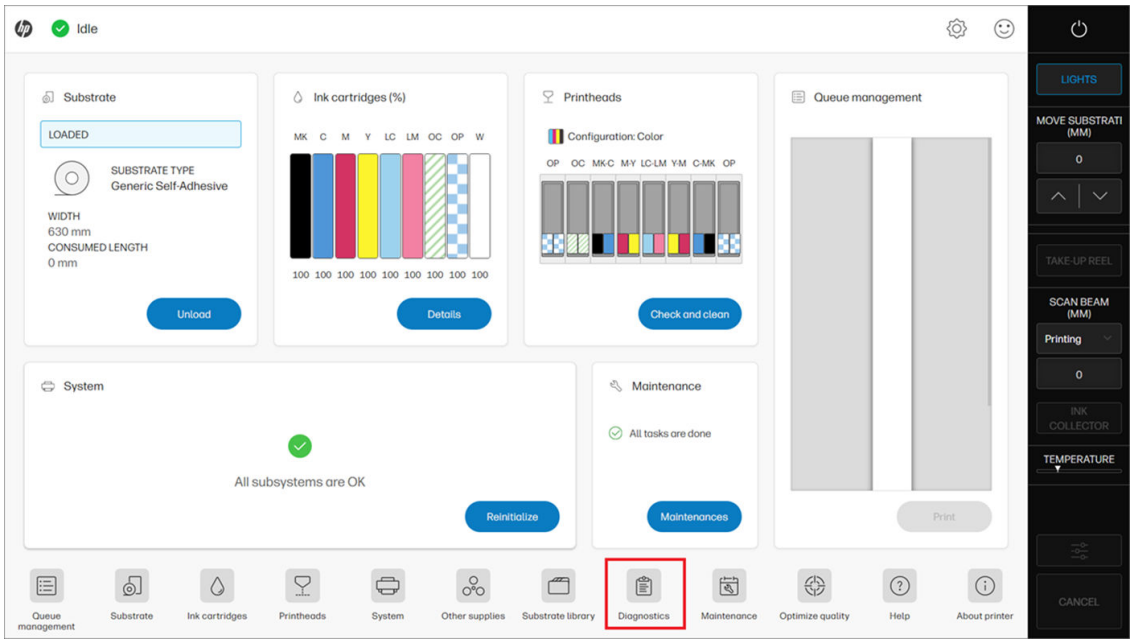
CAUTION: To avoid condensation leaks, ensure that the bottle is pushed all the way into its support, and that the condensation tubes are pointing to the funnel of the bottle.

7. Close the door.

12 Diagnostics

You can access diagnostics that help you to minimize downtime.

To do so, tap the Diagnostics icon 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, tap the power button and then **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, tap the power button and then **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 code is related to the subsystem, and can be found in the following table.

Table 12-1 The NN part of the code is related to the subsystem

Number	Subsystem
01	E-box
10	Power box
11	Printhead control link
16	Curing
17	Drying
22	Ink delivery system
27	Printhead
30	Vapor removal
41	Substrate path mechanics
43	Substrate path vacuum system
45	BIOS
46	Printer ID PCA
47	Printhead cleaning roll
48	Print to paper space
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
89	Movable Slot System

Table 12-1 The NN part of the code is related to the subsystem (continued)

Number	Subsystem
90	Internal firmware errors
92	Internal Print Server

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, HP recommends running the Safety Interlocks diagnostic to ensure that printing is not disabled by a safety interlock.

13 Troubleshoot substrate issues

Loading and printing issues.

Substrate cannot be loaded successfully

This topic explains the concepts involved in this subject.

- A substrate cannot be loaded unless all printer subsystems (such as the ink system) are ready.
- 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.
- If the Internal Print Server displays a message 'The carriage beam height is not suitable for loading substrate', contact your service representative.

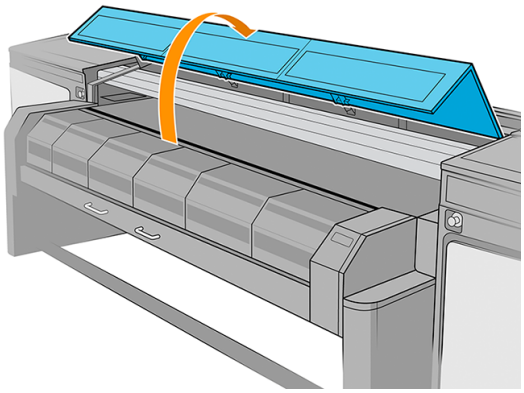
Substrate has jammed

If the printer reports a substrate 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 window.



4. 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, contact your service representative.
5. Start the printer in service mode.

6. Use the Internal Print Server to raise the carriage beam, and check underneath for any pieces of substrate.
7. Use the Internal Print Server to lower the carriage beam to its normal position.
8. Before restarting the printer, check that all circuit breakers are on and all emergency stop buttons released.
9. Restart the printer in normal mode.
10. Reload the substrate.

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: one valve for the single-roll spindle, and both valves for the dual-roll spindle.

NOTE: If you are using only one half of the dual-roll spindle, only that half needs to be inflated.

- For dual-roll printing, check that the differential hub is unlocked.
- Check that the inner diameter of each substrate core is not too large for the spindle.

If the roll is not firmly attached to the input core, proceed as follows.

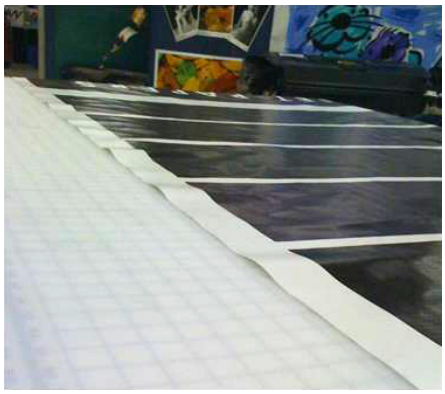
1. Unload the roll from the input spindle and load it onto the output spindle. Take care to avoid telescoping.
2. Raise the pinches and, using the Internal Print Server, raise the carriage beam to its maximum height.
3. Unload substrate from the roll and pass it backwards through the printer towards the input spindle. Attach it to the empty core on the input spindle, securing it with adhesive tape. Wrap a couple of turns of substrate around the input core. Take care to align the substrate with the output roll.
4. Lower the pinchwheels.
5. Go to the Internal Print Server and tap **Substrate Load/Unload**, then select the printer configuration and tap **Load**.
6. Select the correct substrate in the Internal Print Server.
7. Tap **Move substrate** in the Internal Print Server, then **Back**, and wait until all the roll has been wound onto the input spindle.

8. You may decide to cancel rewinding when the substrate is detached from the output roll. Then attach it to the output core to print immediately, or rewind it completely onto the input core if you want to remove the roll.

Substrate is not flat

If the substrate does not lie flat when it comes out of the printer, but has shallow waves in it, you are likely to see defects in the printed image, such as vertical stripes.

This can happen when you use thin substrate that becomes saturated with ink; it can also be caused by the combination of heat and vacuum pressure that is applied to the substrate.



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. If you are using a paper-based substrate, try changing to a thicker substrate, or reduce the amount of ink.

Spindle latch suddenly opens during printer operation

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).

Substrate advances with a loud continuous sound of vibration

A loud continuous sound of vibration during the substrate advance can have various causes.

- 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 platen 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. If you are using the roll-to-roll configuration with dual-roll spindles and you see smears, or the substrate is not adhering to the platen, mainly at the outer sides of both rolls, you are recommended to use the center support with both spindles.

   Once installed, you can try to move it up slightly from its calibrated position if you are suffering from wrinkles or the substrate is not adhering to the platen at the outer edges. This could mean that the support has been calibrated below the correct position.

   Otherwise, you can try to move the support down a bit if you are suffering from wrinkles or the substrate is not adhering to the platen at the inner edges near the center of the printer. This could mean that the support has been calibrated above the correct position.

NOTE: Although the center support can be installed while printing, you are recommended to stop the job, unload the substrate, and reload completely, even unwinding the substrate from the output spindle. See Load a roll (dual roll-to-roll configuration) on page 62.

5. Reload the substrate and try to minimize skew while loading. Check that you using the correct loading procedure.
6. 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 280.

NOTE: When printing with dual rolls, you are more likely to notice skew on the output spindle. However, it is not necessarily a problem. If it becomes a problem, proceed in the same way as for a single-roll configuration and consider the use of the recommended center support for dual-roll spindle in both input and output.

TIP: If you notice that one of the substrate edges is not as well tensioned as the other between the platen and the main roller, showing a wave-like shape as it enters the platen, then you are likely to have

skew, and you should consider the use of the center support for dual-roll spindle in both input and output.

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 280), there is no need to take any action. However, you are recommended to reload the substrate in order to eliminate any potential problem.

Some substrate rolls already come with skew; in that case the recommendations are as follows:

1. Try to load the substrate following the correct procedure, taking as a reference of the roll's width the average between peaks of skew.
2. Start with the recommended configuration and increase vacuum and tensions step by step (i to iv), following the table below.

Table 13-1 Vacuum and tensions

Substrate category	Recommended	i	ii	iii	iv	v
Generic Vinyl –vacuum, input tension –output tension	150 60 50	150 60 55	200 60 55	200 70 60	200 70 65	250 80 70
Generic Cast Vinyl	100 35 30	100 45 40	150 60 55	200 75 80	250 80 85	300 100 100
PVC Banner	100 60 60	100 60 65	100 65 70	200 70 75	300 75 80	350 85 85
Coated Paper and Wallpaper	150 60 50	150 65 55	200 65 55	250 70 60	300 75 65	350 85 85
Offset Paper	150 60 50	150 65 55	200 65 55	250 70 60	300 75 65	350 85 85
PET Film	100 60 55	100 65 60	100 70 65	200 70 75	250 75 80	350 85 85
PP PE Film and Banner	150 60 50	150 65 55	150 70 60	250 70 70	300 75 80	350 85 85
Canvas	150 70 55	150 75 60	150 80 65	250 80 75	300 85 80	350 85 85
Generic Textile	0 50 40	50 50 45	100 60 50	150 65 60	250 70 75	350 85 85

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
- Incorrect routing of the substrate through the printer
- 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 platen or telescoping on the output spindle.

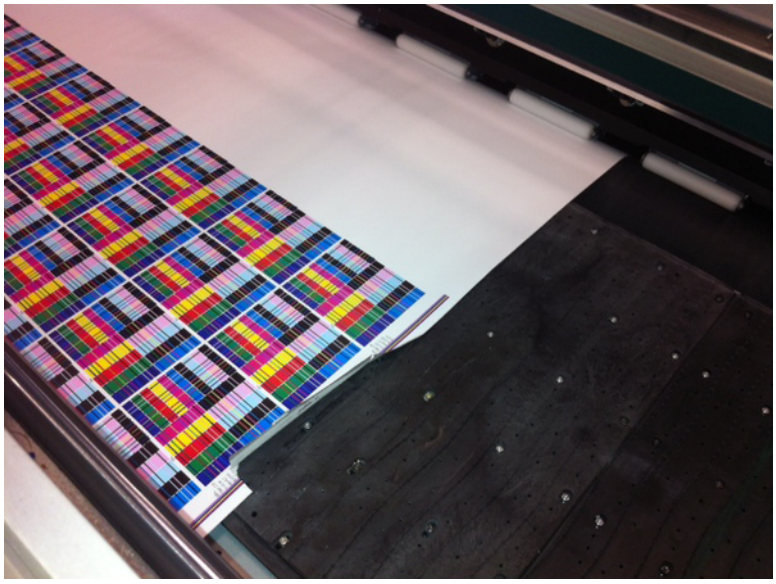
TIP: If you notice that you are suffering wrinkles on the platen and that the substrate between the input spindle and the main roller has lost all tension at one side, try printing in the roll-to-floor configuration, and using the substrate collector if required. If you still see some problems, try to increase tension by following the recommendations below.

TIP: When suffering from wrinkles and extreme skew with a self-adhesive vinyl, calendered materials are typically more sensitive to temperature. Try to use a thicker core to reduce the effects of the spindle's rubber traction grooves, and increase tension as recommended below, using configuration iii, iv, or v in the table.

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 try to minimize skew while loading. 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 (see Substrate edge holders on page 52).

6. Try reducing the drying power and curing temperature.

7. Start with the recommended configuration and increase vacuum and tensions step by step (i to iv), following the table below.

Table 13-2 Vacuum and tensions

Substrate category	Recommended	i	ii	iii	iv	v
Generic Vinyl	150 60	150 60	200 60	200 70	200 70	250 80
–vacuum, input tension	50	55	55	60	65	70
–output tension						
Generic Cast Vinyl	100 35	100 45	150 60	200 75	250 80	300 100
	30	40	55	80	85	100
PVC Banner	100 60	100 60	100 65	200 70	300 75	350 85
	60	65	70	75	80	85
Coated Paper and Wallpaper	150 60	150 65	200 65	250 70	300 75	350 85
	50	55	55	60	65	85
Offset Paper	150 60	150 65	200 65	250 70	300 75	350 85
	50	55	55	60	65	85
PET Film	100 60	100 65	100 70	200 70	250 75	350 85
	55	60	65	75	80	85

Table 13-2 Vacuum and tensions (continued)

Substrate category	Recommended	I	II	III	IV	V
PP PE Film and Banner	150 60	150 65	150 70	250 70	300 75	350 85
	50	55	60	70	80	85
Canvas	150 70	150 75	150 80	250 80	300 85	350 85
	55	60	65	75	80	85
Generic Textile	0 50	50 50	100 60	150 65	250 70	350 85
	40	45	50	60	75	85

TIP: If you have suffered a substrate crash, try starting with step iv and moving backwards up the table until you find settings that work.

8. Try reducing the curing temperature and ink quantity, and raise the curing airflow to help in reducing the substrate's thermal contraction.
9. Consider changing the printer configuration. Use the roll-to-free-fall configuration as it is least prone to wrinkles.
10. 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 86.

There are ink marks on the substrate

This problem can occur if any component in contact with the substrate is dirty. Check the pinchwheels, diverters, print platen, curing module plates, and roller, 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.

Substrate sticks to the platen

When the substrate sticks to the platen, the most likely causes are excessive heat applied by the drying system, excessive vacuum, or a dirty platen, which increases friction and can impede the substrate advance.

In the latter case, the substrate may rise up in a bubble or wave before reaching the platen.

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 you are printing on the correct side of the substrate.
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. Reload the substrate and try to minimize skew while loading. Check that you are loading the substrate using the correct procedure.

5. Increase vacuum and tensions step by step (i to v) following the table below, until you find settings that work.

Table 13-3 Vacuum and tensions

Substrate category	Recommended	I	II	III	IV	V
Generic Vinyl	150 60 50	150 60 55	200 60 55	200 70 60	200 70 65	250 80 70
Generic Cast Vinyl	100 35 30	100 45 40	150 60 55	200 75 80	250 80 85	300 100 100
PVC Banner	100 60 60	100 60 65	100 65 70	200 70 75	300 75 80	350 85 85
Coated Paper and Wallpaper	150 60 50	150 65 55	200 65 55	250 70 60	300 75 65	350 85 85
Offset Paper	150 60 50	150 65 55	200 65 55	250 70 60	300 75 65	350 85 85
PET Film	100 60 55	100 65 60	100 70 65	200 70 75	250 75 80	350 85 85
PP PE Film and Banner	150 60 50	150 65 55	150 70 60	250 70 70	300 75 80	350 85 85
Canvas	150 70 55	150 75 60	150 80 65	250 80 75	300 85 80	350 85 85
Generic Textile	0 50 40	50 50 45	100 60 50	150 65 60	250 70 75	350 85 85

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 you are using the generic substrate preset for the substrate category. The use of incorrect values could cause incorrect substrate behavior.

3. Reload the substrate and try to minimize skew while loading. Check that you are loading the substrate using the correct procedure.

4. Try to reduce curing temperature and ink quantity if possible, and raise the curing airflow to help in reducing the substrate deformation.

5. Reduce tensions and modify vacuum settings, following the table below step by step (a to c), until you find settings that work.

Table 13-4 Vacuum and tensions

Substrate category	c	b	a	Recommended
Generic Vinyl		50 50	100 60	150 60
		35	50	50
Generic Cast Vinyl			50 35	100 35
			30	30
PVC Banner	50 40	100 50	100 60	100 60
	30	40	50	60
Coated Paper and Wallpaper		150 50	150 55	150 60
		40	45	50
Offset Paper		50 40	100 50	150 60
		30	40	50
PET Film	50 40	100 50	100 60	100 60
	30	40	50	55
PP PE Film and Banner	50 40	100 50	100 60	150 60
	30	40	50	50
Canvas	50 50	100 60	100 70	150 70
	35	45	55	55
Generic Textile	0 35	0 40	0 45	0 50
	30	30	35	40

There are drops of ink on the substrate

The following steps provide the complete procedure for this topic.



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 Internal Print Server recommends replacing or reseating a printhead on page 306.
4. Clean the under-carriage protector.
5. Clean the aerosol extractor.

Print is shorter than expected

Some substrates naturally contract when they are printed on and cured, so that the total length of the print is shorter than expected.

In this 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 which 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.

   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.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.
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).

Collector stops winding

The collector has a safety timer that will stop rewinding substrate if it is not fully collected after 30 seconds, and will stop unwinding substrate after 5 seconds if the substrate loop is not detected by the collector sensor.

If you have a lot of substrate to be collected lying on the floor, you will have to restart the collector by tapping the corresponding icon.

- If the collector keeps stopping, and collector movement causes the substrate to be tight between pressure roller and collector when winding, there could be an object blocking the collector sensor path, or the winding direction may not have been selected correctly when restarting the collector.

- If the collector keeps stopping, and collector movement makes substrate loops accumulate on the ground when unwinding, it is possible that the winding direction has not been selected correctly when restarting the collector, or that the collector sensor or electronics are broken and should be replaced.

Collector occasionally fails to work correctly

The collector may fail to work correctly if its optical sensor is dirty or blocked by some obstacle.

Collector winds in the wrong direction

The following steps provide the complete procedure for this topic.

1. Check that the winding direction is set correctly in the Internal Print Server.
2. Check that there is no obstacle blocking the collector's optical sensor.

Substrate is detached or winds around the collector in the wrong direction

Here are some possible explanations.

- The winding direction has been set wrongly.
- The collector has been loaded wrongly.

There is skew or telescoping on the collector

This may happen if the substrate was not properly aligned when attaching it to the collector core. You are recommended to follow the loading instructions; in particular, align the substrate well.

TIP: If you have a lot of substrate lying on the ground after printing in roll-to-free-fall mode, and you want to attach it to the core, you are recommended to choose a core that is the same width as the substrate, so that a good length of substrate can be aligned around the core before you attach it.

If you cannot resolve the problem satisfactorily, you are recommended to use the roll-to-roll configuration instead, which has better winding performance.

Substrate has jammed on the collector

Here are some possible explanations.

- Too much substrate on the collector. The maximum diameter of the output roll is 300 mm (11.8 in) for the recommended outwards winding, or 200 mm (7.9 in) for inwards winding.
- The substrate is misaligned.
- The loop shaper is the wrong length.

14 Troubleshoot print-quality issues

The following sections provide details for this topic.

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.

Table 14-1 Appropriate viewing distances

Print mode	To view output at...
3 pass (outdoor)	
4 pass (indoor)	
8 pass (high quality) and white print modes	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 343.

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 275.
- 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 56.
- 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 73.
- Make sure it has also been performed in the current conditions, especially considering substrate batch and printheads. See Color calibration on page 142.

Basic and advanced troubleshooting

The following sections provide details for this topic.

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

Access HP Control Print from the Internal Print Server to troubleshoot print-quality issues.

Identify the defect. This basic procedure applies to the following defects:

- Horizontal banding
- Graininess
- Color misalignment

- Blurred lines, edges, and text, horizontally and verticallyBlurred 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

Perform the actions described in the following table.

Table 14-2 Actions

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
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 (example: 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

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.

See Check and clean the printheads on page 106.

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

Perform the printhead alignment, manual or automatic.

The result of the alignment can be verified and modified with the printhead-alignment verification plot. See Manual alignment procedure on page 137.

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 309.

Print-quality artifacts troubleshooting

The following sections provide details for this topic.

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

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 verification plot (see Manual alignment procedure on page 137). The biggest contributor to thin-dark-line banding caused by printhead alignment is inter-color misalignment (misalignment between different colors).

TIP: Fine-tune the alignment by identifiying the offenders in the printhead-alignment verification plot. See Manual alignment procedure on page 137.

- **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.

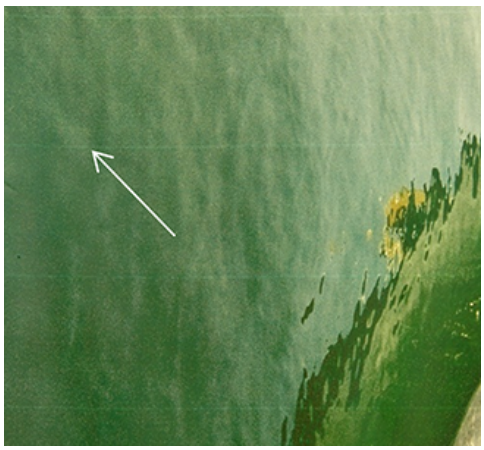
If the substrate advance is not well adjusted, particularly if it is under-advancing, a dark line can appear between passes.

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, see Substrate-advance verification on page 147.

You can usually correct this problem by adjusting the substrate advance compensation (see Substrate-advance compensation on page 145). 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 309.
- **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 verification plot (see Manual alignment procedure on page 137). 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:

- Perform printhead alignment. There is no need to repeat the alignment at each white position: the correction is preserved despite moving the white printhead along the movable slot system.
- 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.

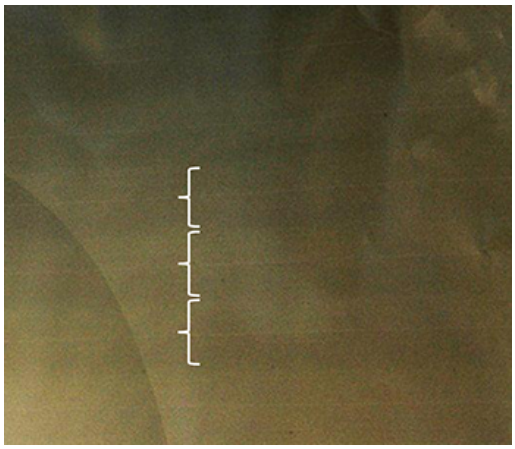
  If the substrate advance is not well adjusted, particularly if it is over-advancing, a white line can appear between passes.

  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, see Substrate-advance verification on page 147.

  You can usually correct this problem by adjusting the substrate advance compensation (see Substrate-advance compensation on page 145). 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 86.

- **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 verification plot (see Manual alignment procedure on page 137). 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:

  - Perform printhead 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 verification plot. See Manual alignment procedure on page 137.

Gloss banding

This appears in dark, high-density areas as horizontal gloss or matte bands about 2–3 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 or changing your viewing position, 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 106). 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.

If you see aeroworms, here are some tips for solving the problem:

- Increase the number of passes.
- Reduce the ink density.
- Check that the aerosol filters are not saturated or broken (see Replace the aerosol filters on page 113).

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 86.

Image content-dependent banding

This consists of a color variation that appears in some color area fills that contain cyan.

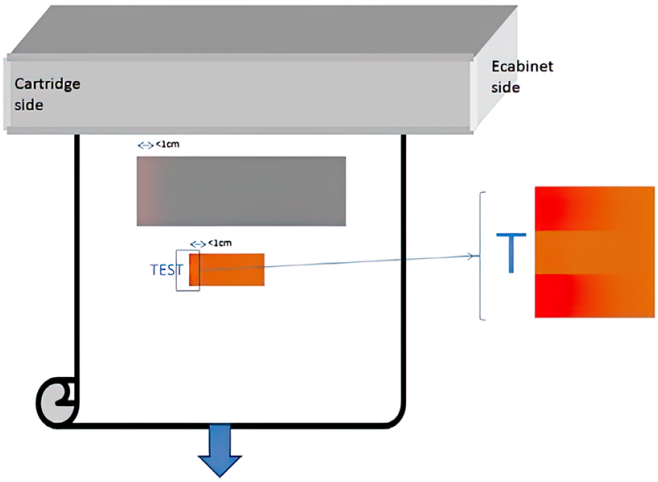


Here are some tips for solving this problem:

- 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, the initial ink drops may be missing or slightly darker, producing a local color variation.



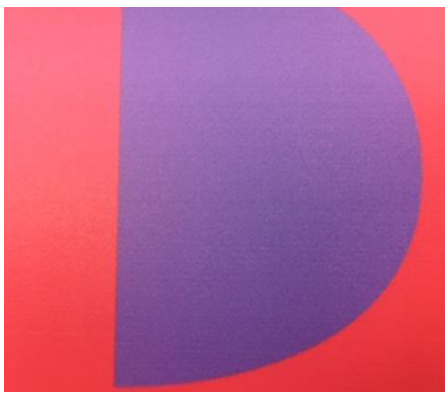
These defects are due to the printheads traveling from side to side without printing.

- In each pass, the first drops of a color are missing or smaller.
- In each pass, the first 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:

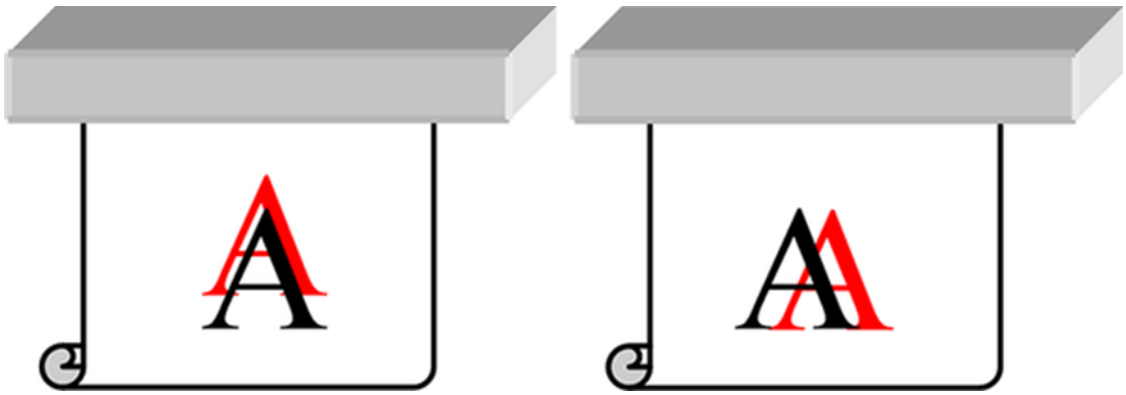
- Check and clean the printheads. See Check and clean the printheads on page 106.
- Check and clean the left printhead cleaning blade. See Check and clean the left printhead cleaning blade on page 186.
- Check that there are no obstacles in the substrate path.
- Increase the number of passes.
- Decrease 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.

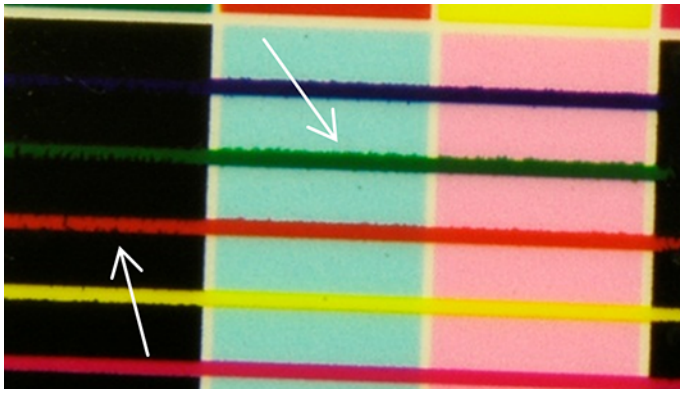


Color misalignment is most likely to be caused by printhead misalignment. To check printhead alignment, print the printhead-alignment verification plot (see Manual alignment procedure on page 137).

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 verification plot (see Manual alignment procedure on page 137). If necessary, perform printhead alignment, then reprint the printhead alignment verification plot.

  If the problem is in the substrate axis direction, it may also be caused by incorrect substrate advance. See Substrate-advance verification on page 147 and Substrate-advance compensation on page 145.

- **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 142).

- **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.

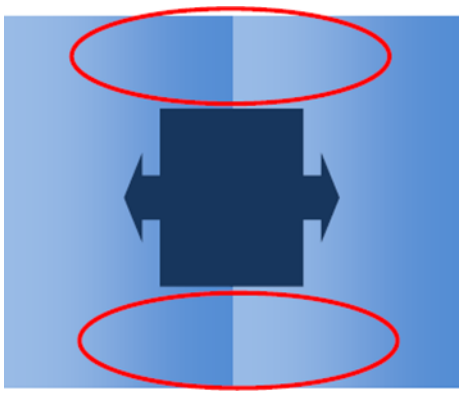
- **Ink density**, which affects color saturation. If the color saturation of your print seems wrong, try changing the ink density in the substrate preset; you may need to change the number of passes at the same time.

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.

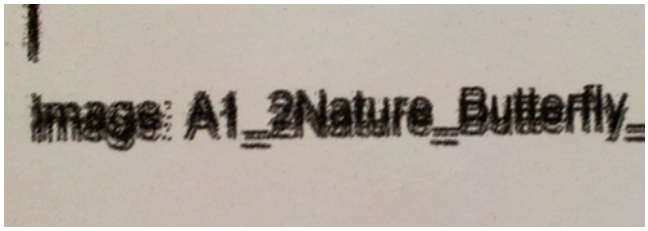
See How to achieve better consistency between jobs of the same length on page 285



- **Uniform variations from tile to tile.** When color changes uniformly it must be within the color consistency specification; see Color consistency on page 49 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 296. 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.
- 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 297.
- **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 verification plot (see Manual alignment procedure on page 137), 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, see Substrate-advance verification on page 147.

  To correct the substrate advance, see Substrate-advance compensation on page 145. 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-substrate spacing.** Check the printhead-to-substrate spacing in the Internal Print Server. If it is higher than normal, try reducing it.

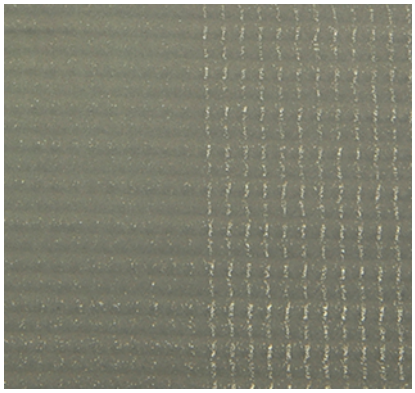
Graininess

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.

- **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 verification plot (see Manual alignment procedure on page 137). 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)

  If the printhead alignment was done when the printer was cold, print a job and then try the alignment again.

- **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, see Substrate-advance verification on page 147.

  To correct the substrate advance, see Substrate-advance compensation on page 145. 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 280.

- **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:

- Platen 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 283.

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.



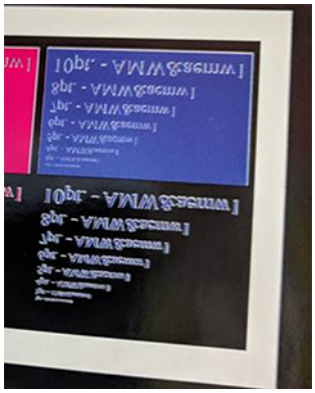
- **Wet print:** The ink comes out of the curing module not perfectly dry, and in severe cases the ink can be smudged by touching it.

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.
- Increase the number of passes.

White-to-color misalignment

In some white-ink applications, the white ink may be seen at the edges of the image. If this happens:

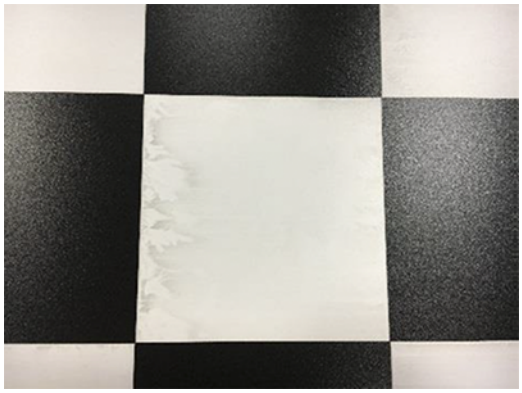


1. Check printhead alignment, and realign if necessary.
2. Shrink the white plane in the RIP software, or use the choke option.

Static electricity

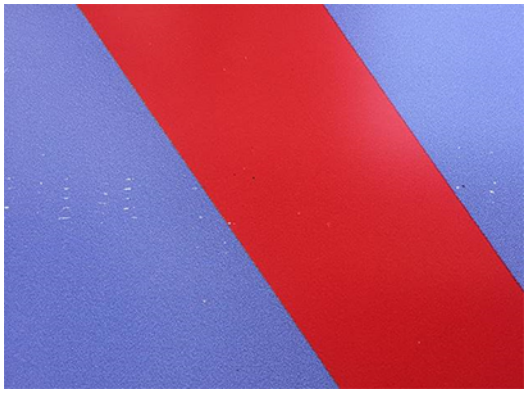
Some substrates have high electrostatic charges because of their liners, and they attract aerosol and dirt while printing.

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 substrate path or a small curing margin. If the problem persists after cleaning, 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.

15 Troubleshoot ink cartridge and printhead issues

The following sections provide details for this topic.

Ink cartridges

The following sections provide details for this topic.

Cannot insert an ink cartridge

The following steps provide the complete procedure for this topic.

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 97.
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).

Internal Print Server does not recognize an ink cartridge

The following steps provide the complete procedure for this topic.

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 306).
4. If the problem still persists, contact your service representative.

Internal Print Server recommends replacing or reseating an ink cartridge

The following steps provide the complete procedure for this topic.

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 306).
4. If the problem persists, insert a new ink cartridge.

5. If the problem still persists, contact 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 97).

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

The following sections provide details for this topic.

Cannot insert a printhead

The following steps provide the complete procedure for this topic.

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 101 and Insert a printhead on page 103, 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).

Internal Print Server recommends replacing or reseating a printhead

The following sections provide details for this topic.

General recommendations

The following steps provide the complete procedure for this topic.

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.
4. Find more troubleshooting information in the following sections, Problem due to overheating on page 306 and Problem due to the primer system on page 307.
5. If the problem persists, insert a new printhead.
6. If no printhead works in that slot, contact 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 106).
- The printhead may be faulty, in which case it should be replaced.

Problem due to the primer system

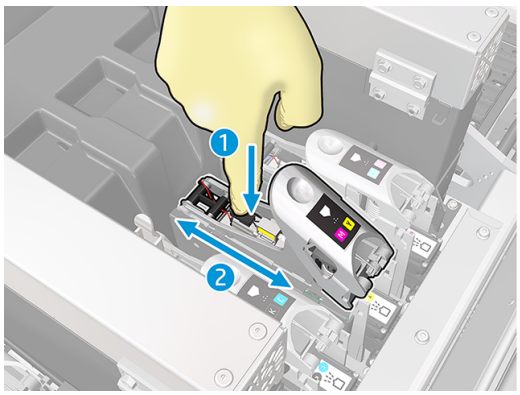
Primers are important to the printheads' nozzle health. When there is a problem with a primer, the Internal Print Server displays the following messages.

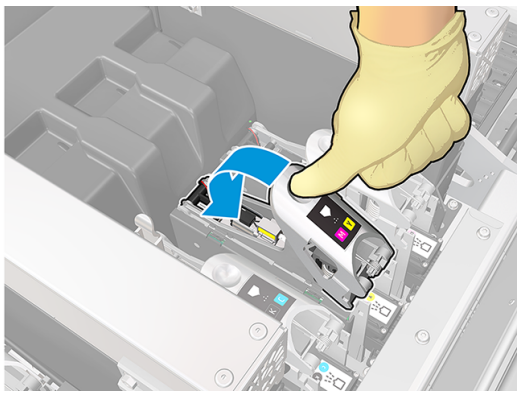
- A reseat message for a particular printhead
- A printhead replacement incomplete message
- A numerical error code starting with 0088 (for colour primers) or 1088 (for white primers): 0088-00XX-YYZZ or 1088-00XX-YYZZ
- A reseat message for a particular printhead
- A numerical error code starting with 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.

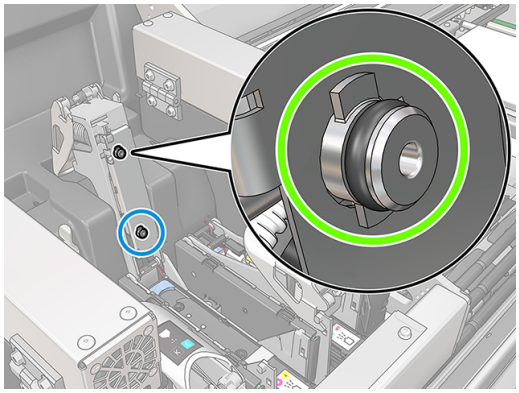
You are recommended to:

- 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 Clean and grease the printhead primers on page 256.

If none of these actions resolve the problem, contact 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 contact your service representative with the test results at hand.

Wrong printhead insertion in the Dynamic Movable Slot System FI Tower

The following explains the procedures if you insert the wrong printhead in the Dynamic Movable Slot System FI Towe

In the Movable Slot System of the HP Latex FS50 W/FS60 W we insert two different Printheads in the same slot, but with two different FI Towers for each Printhead. If you accidentally insert a Printhead in the wrong FI Tower, we might have an ink contamination in the Printhead that would result in bad IQ.

HP Latex Printheads have a unique structure to avoid this kind of issues. Only a White Printhead can be inserted in the White FI Tower and only a color Printhead can be inserted in the CK FI Tower.

However there is a possibility to damage this structure and therefore to be able to insert the wrong Printhead in the wrong FI Tower.

Here are the possible modes of failure and the troubleshooting for each case:

If the printer is in White mode and White Printhead inserted in CK FI Tower

The white Printhead and the CK FI tower septum will be contaminated. If this is the case remove the Printhead immediately and call your support representative for further assistance.

If the printer is in Turbo mode and CK Printhead inserted in White FI Tower

During the change of configuration a blockage will be detected, as there is no jumper inserted in White Slot and it cannot recirculate through the Printhead. A small amount of ink can go inside the PH and the FI tower septum will be contaminated. If this is the case call your support representative for further assistance.

In other situations, where a wrong Printhead is inserted in a different configuration, the printer will detect the wrong insertion and display a system error or request a change if it occurs during a configuration change. If this is the case call your support representative for further assistance.

Printhead-health troubleshooting

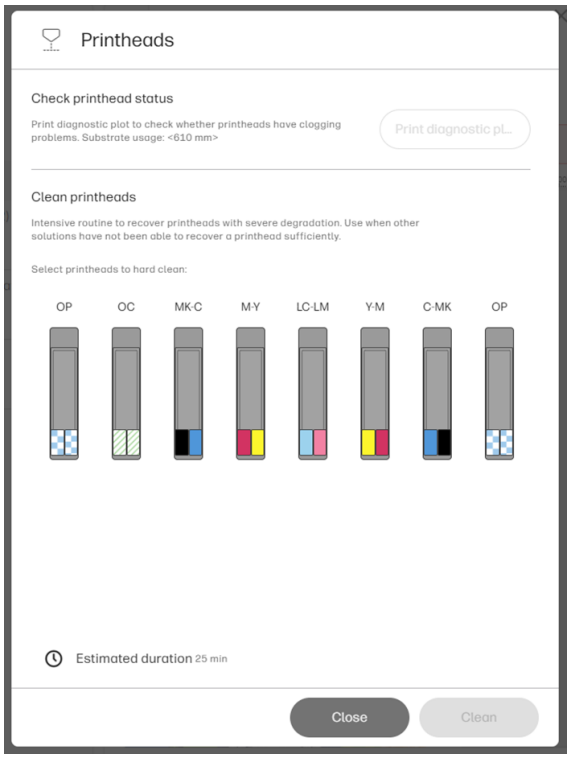
There are two ways to check the status of the printheads: the printhead status plot and the nozzle health check in maintenance. Always use both, as they provide complementary information. They identify any blocked printhead nozzles.

Printhead status plot

The purpose of the printhead status plot is to identify which printhead nozzles are working and which are not.

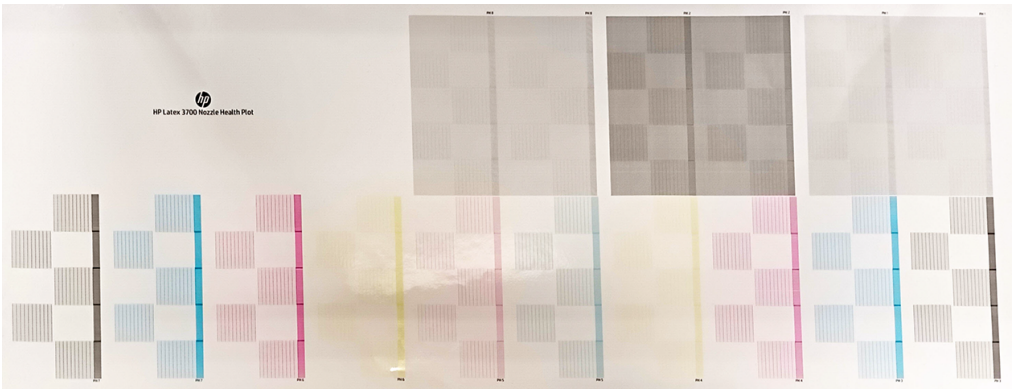
If you have the white-ink printhead mounted on the carriage, you are recommended to print this plot on a transparent flexible substrate. Otherwise, the colors may not be sufficiently visible.

To print the printhead diagnostic plot, go to the Internal Print Server and tap **Printheads replace** > **Hard clean** > **Print diagnostic plot**.

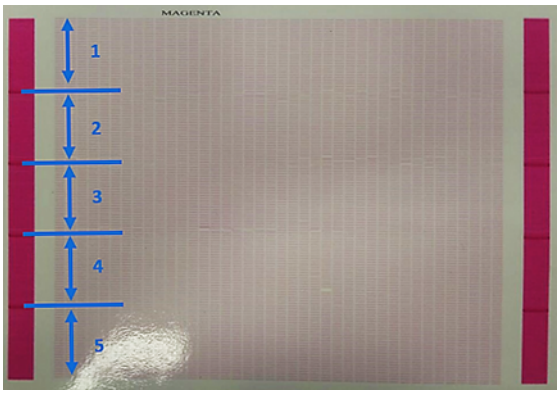


The printer detects whether a white printhead is installed, and (depending on that) prints a plot with or without white ink and the second optimizer.

If there is no white printhead, the following image is printed.



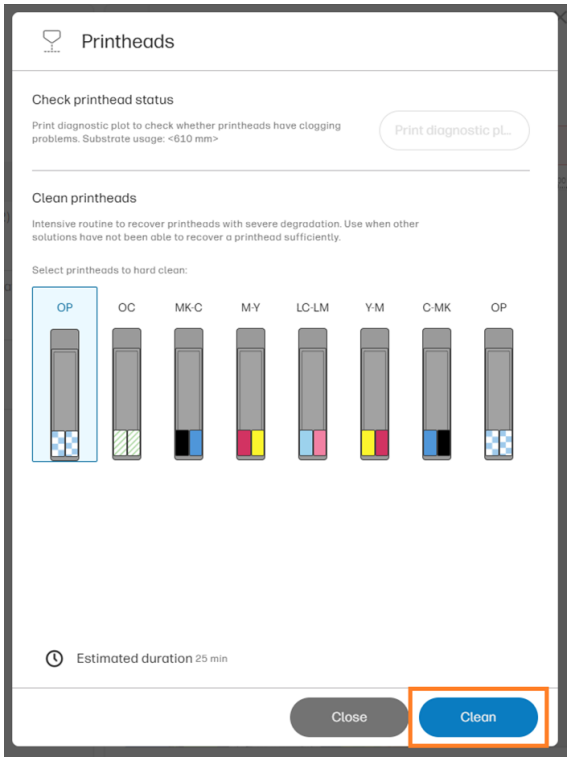
One pattern shows plainly which nozzles in each printhead are printing and not printing. For reference, each one of the five areas (square in the picture and 1 to 5) of each color corresponds to approximately 1000 nozzles.



Hard clean

This topic provides a full set of reference information for this subject.

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.

Table 15-1 Diagnostics data

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.

Table 15-1 Diagnostics data (continued)

Nozzle health	Drop detector	Possible cause	Action
< 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.

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 108.

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.

16 Troubleshoot other issues

The following sections provide details for this topic.

Printer does not start

The following steps provide the complete procedure for this topic.

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 Internal Print Server 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.

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.

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.

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 106).
- 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.

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 **Power** 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 280.
  - 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 288.

- Either the embedded spectrophotometer or the line sensor is not working properly. If the problem persists, call your service representative.

Movable Slot System sensor errors

If the printer fails to detect a change of position of the Movable Slot System (MSS) during a configuration change, a sensor has probably been damaged.

Respond as follows:

1. Check that you are moving the MSS elements as directed by the Internal Print Server, or check the labels.
2. Run diagnostic 89004 (Movable Slot System sensors check) to find out which sensor is not working properly.
3. Call a service engineer as soon as possible to repair the sensor.

To avoid leaving the printer idle because of a position sensor, there is a **Skip step** button in each step of the configuration change process. You can continue printing as follows:

1. Start the change of configuration.
2. Follow the instructions and move the elements as indicated in the Internal Print Server.
3. Identify the step in which the Internal Print Server does not detect a physical change of an MSS element.
4. Use the labels to verify that the element is where it should be.
5. Tap the **Skip step** button. You are warned to ensure that MSS elements are placed in the correct position for the selected configuration.

⚠ CAUTION: If the printhead pocket and the capping station are not aligned, the printhead will be damaged.

6. Finish the process, after which the printer will be ready to print.
7. Remember to call a service engineer as soon as possible to repair the sensor.

Major errors in the substrate-axis direction

An error of more than 5 mm in the substrate-axis direction is regarded as major.

These are the possibilities:

- The sensor is not working properly, and the printhead pocket is not positioned correctly. Proceed as follows:
  1. Check that you are moving the MSS elements as directed by the Internal Print Server, or check the labels.
  2. Run diagnostic 89004 (Movable Slot System sensors check) to find out which sensor is not working properly.
  3. Call a service engineer as soon as possible to repair the sensor.

- The Skip step button has been used, and the printhead pocket is not positioned correctly. Proceed as follows:
  1. Look at the labels to check whether the MSS elements have been positioned correctly.
  2. Call a service engineer as soon as possible to repair the sensor.
- The positioning screw has not been tightened. Proceed as follows:
  1. Check that the printhead pocket can be moved by hand from one position to the other.
  2. Tighten the positioning screw with the tool stored in the carriage.

Minor errors in the substrate-axis direction

An error of less than 5 mm in the substrate-axis direction is regarded as minor.

These are the possibilities:

- The positioning screw has not been fully tightened. Proceed as follows:
  1. Check that the printhead pocket can be moved slightly by hand.
  2. Tighten the positioning screw with the tool stored in the carriage until you feel and hear a click in the tool.
- The alignment of B2 and C2 values is different each time the verification plot is printed. Proceed as follows:
  1. Tighten the positioning screw with the tool stored in the carriage until you feel and hear a click in the tool.
  2. Print a verification plot and note the B2 and C2 values.
  3. Release the positioning screw, move to another position, then return to the original position.
  4. Tighten the positioning screw with the tool stored in the carriage until you feel and hear a click in the tool.
  5. Print a verification plot and note the B2 and C2 values.
  6. Check that the values from both verification plots are the same.
  7. Call a service engineer as soon as possible to repair the MSS assembly.

17 When you need help

HP is here to help you.

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/

HP PrintOS: the cloud-based platform for print specialists

HP PrintOS is a Cloud-based operating system that includes several applications for customers and HP-certified Partners that help them to get the most out of their HP printers.

PrintOS helps customers to simplify and automate production processes, have full knowledge of their printer's productivity, improve their operations, and enable new forms of collaboration.

PrintOS helps HP-certified Service Delivery Partners to provide quick service support and reduce resolution times while saving operational costs and delivering a superior service experience.

See also *What is HP PrintOS* at https://www.hp.com/us-en/commercial-printers/floater/printos.html.

Watch how to drive your operational excellence continuously with the HP PrintOS mobile app, at https://www.youtube.com/watch?v=_ZyI-Xn4E4I.

Download the HP PrintOS for PSP mobile app from https://printosmobile.carrd.co/?_branch_match_id=938065113769545607.

Join now at http://www.printos.com/ and https://printosmobile.carrd.co/?_branch_match_id=938065113769545607.

Figure 17-1 PrintOS for PSP mobile app



Figure 17-2 Monitor your site's performance in the palm of your hand



Register your organization and printers in PrintOS

Congratulations on buying your new HP Latex printer! You're now ready to add your new device to HP PrintOS and start enjoying right away all the benefits of a revolutionary cloud-based print-production operating system.

Ask your HP Certified Partner to help you register

The easiest way to register your organization or printer is with the help of your HP Certified Partner or HP installer.

Alternatively, see Self-registration instructions on page 318.

Self-registration instructions

There are three ways to register yourself in PrintOS, depending on your situation.

- Register and connect your device before creating an account on page 318
- Register and connect your device when you do not have an account on page 321
- Register and connect your device when you already have an account on page 328

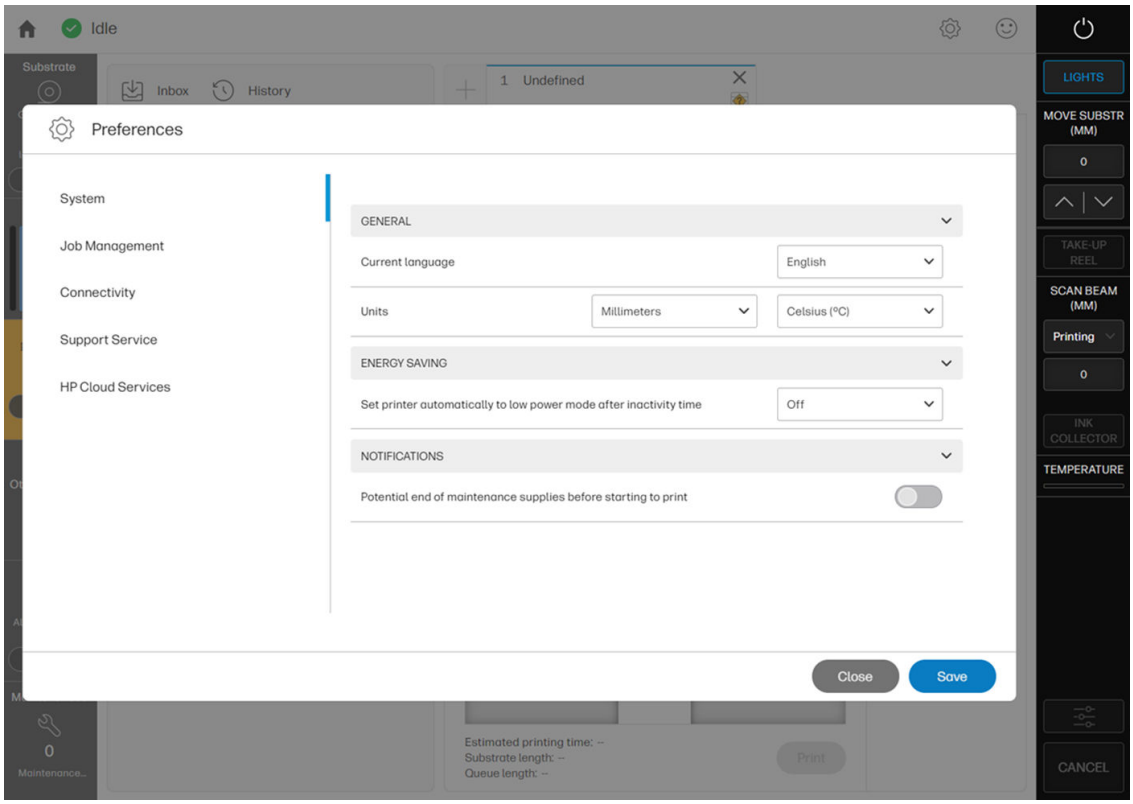
All three ways are easy. If you have any questions, contact either your HP Channel Partner, or HP PrintOS Support at https://www.printos.com/start/#/support/.

HP recommends that you connect your PrintOS account to your HP Channel Partner's PrintOS account, so that your Partner can give you and your printers the best possible support.

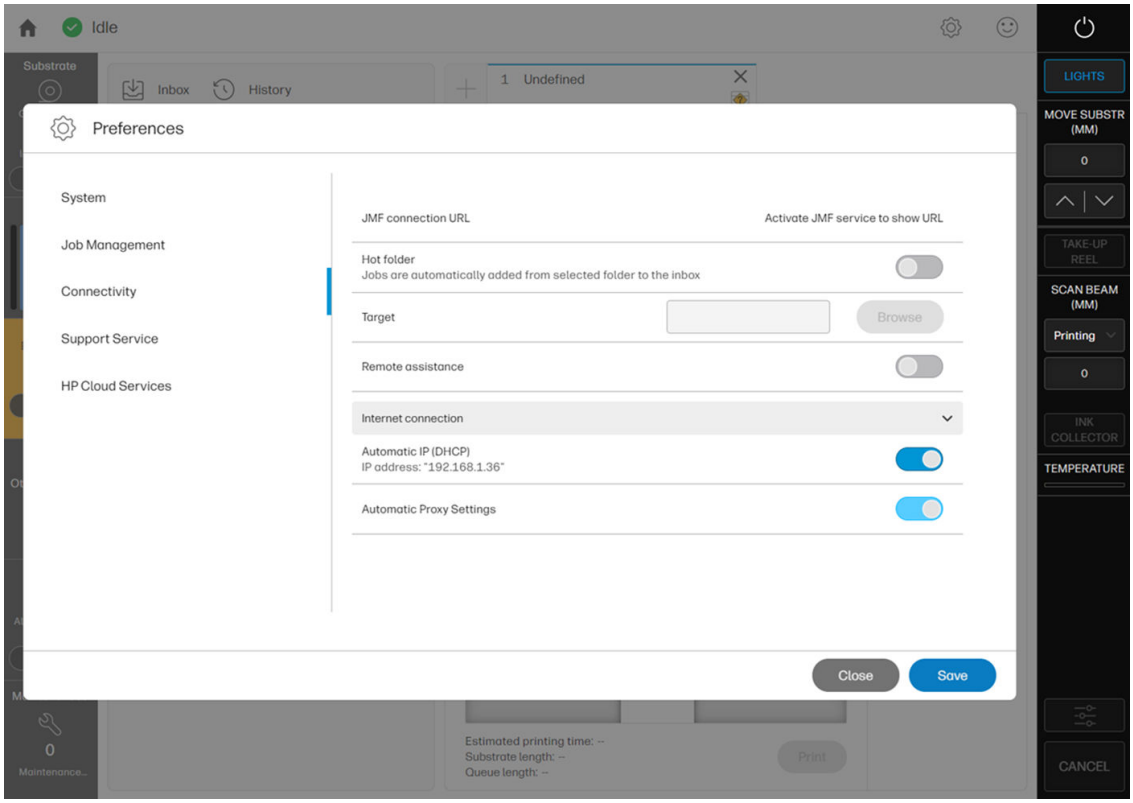
Register and connect your device before creating an account

To use PrintOS, first you have to connect your device.

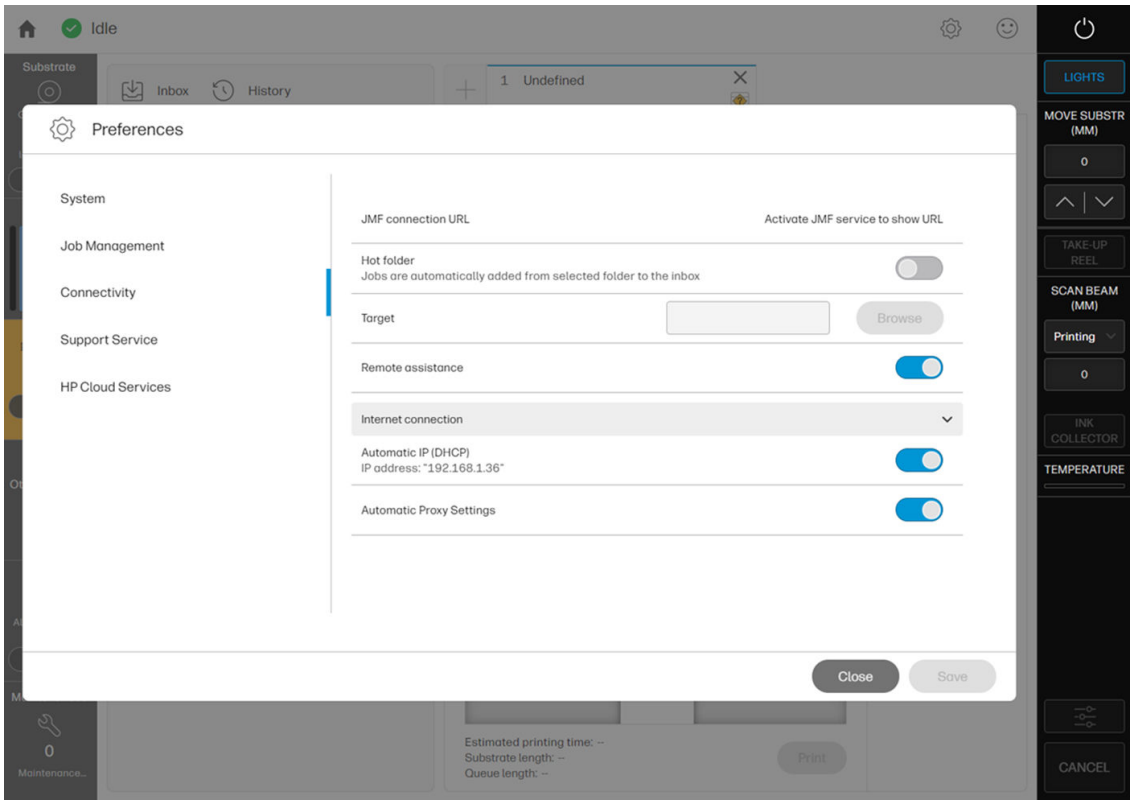
1. At your printer's Internal Print Server, open the **Preferences** menu.



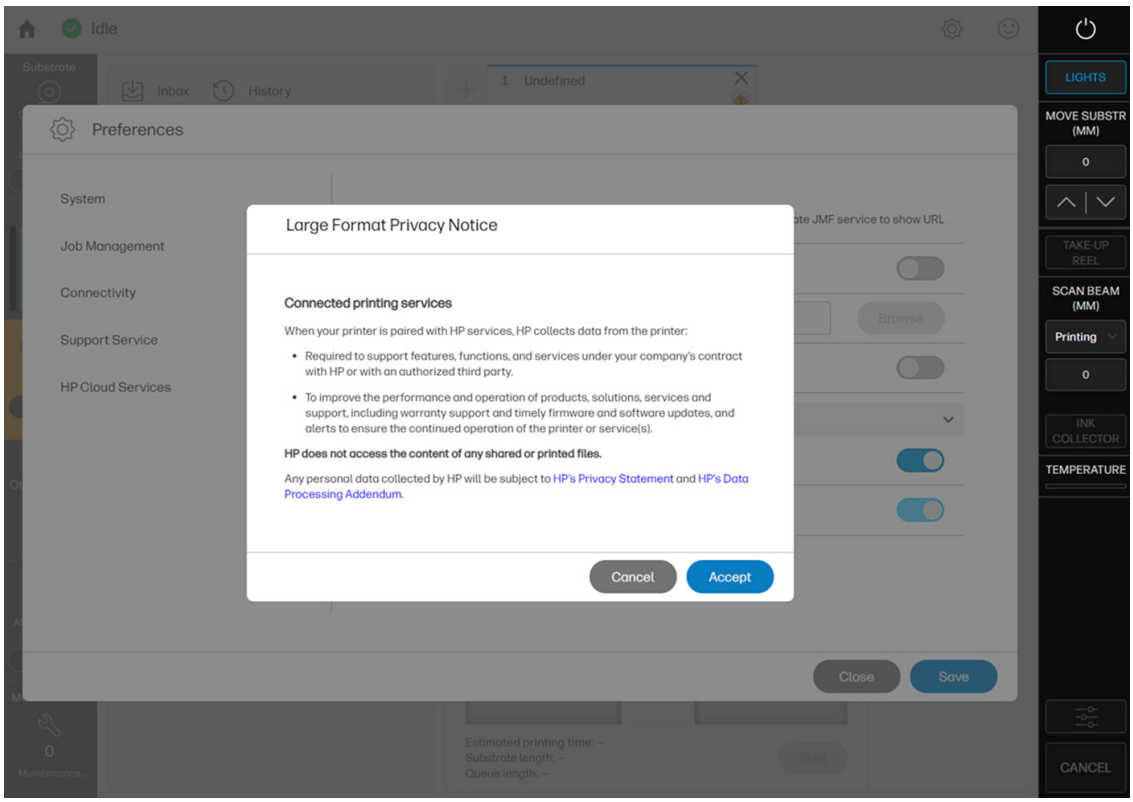
2. Tap **Connectivity**.



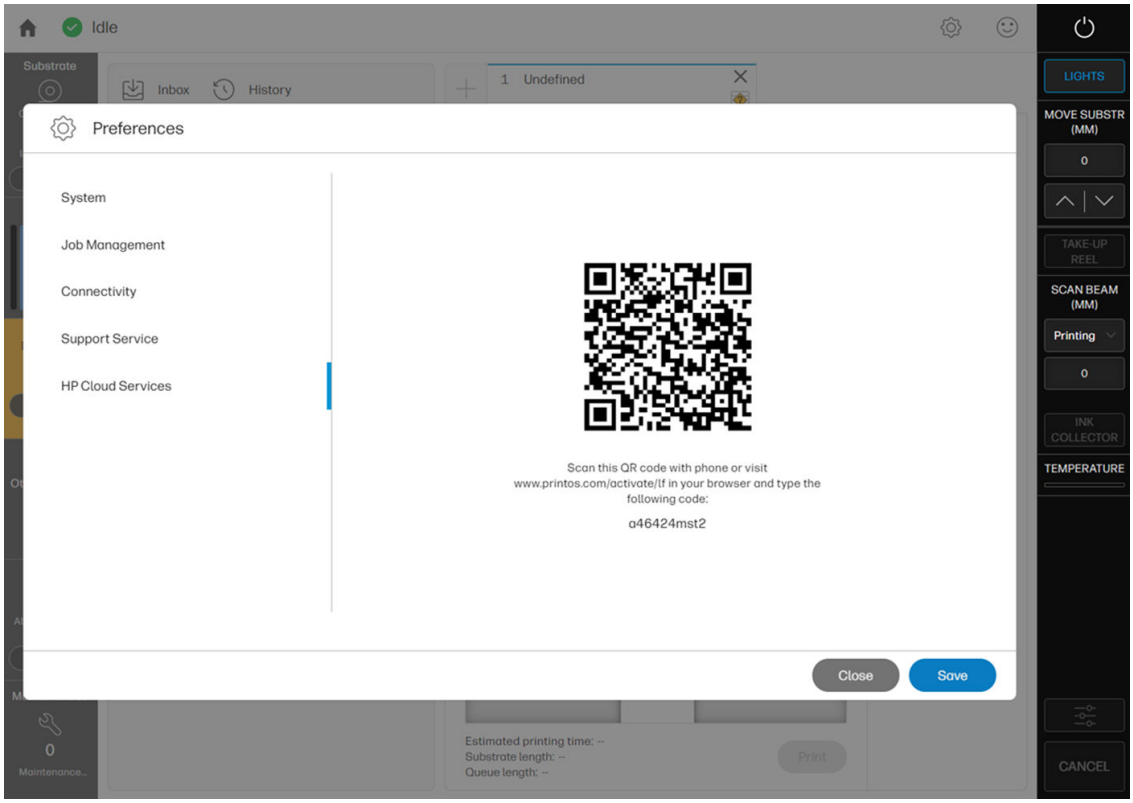
3. Tap **Remote assistance**.



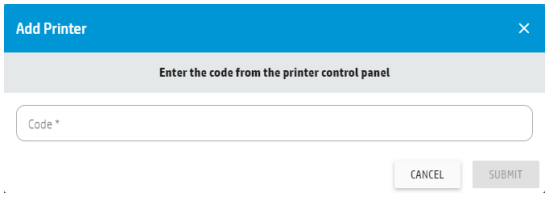
4. Tap **Accept** to accept the Printer Data Sharing Agreement.



5. Your printer now generates a QR code and is ready to be added to PrintOS directly from your mobile device. Scan the QR code with your smartphone or tablet using either the camera or a QR scanner app.



Alternatively, you can go to https://www.printos.com/activate/lf/ and activate your printer with a security code, found in the previous QR code generation section.



You have now completed PrintOS registration. The Internal Print Server should redirect you to the HP PrintOS SIGN-IN/JOIN page.

IMPORTANT: Registering your printer is important in order to have Proactive Support enabled, and you have to accept the Printer Data Sharing Agreement (by tapping **Preferences** > **Connectivity** > **Remote assistance**). See also HP Service Center on page 330.

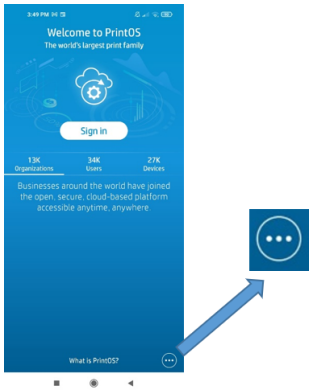
Register and connect your device when you do not have an account

In order to use PrintOS, first you have to connect your device.

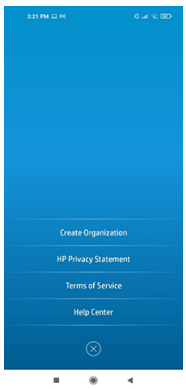
1. Download the PrintOS for PSP mobile app by scanning one of the QR codes below.

Android	iPhone
GET IT ON Google Play	Download on the App Store

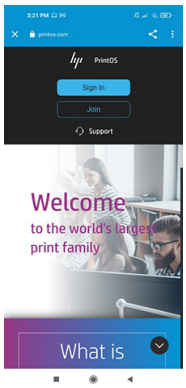
2. Open the PrintOS app and tap the three dots.



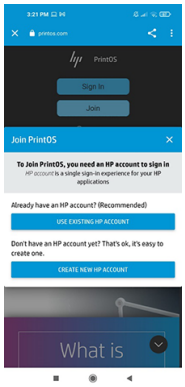
3. Tap **Create Organization**.



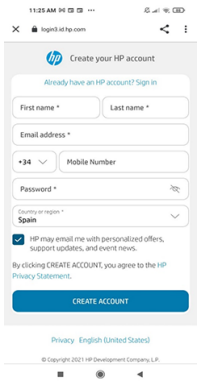
4. Tap **Join**.



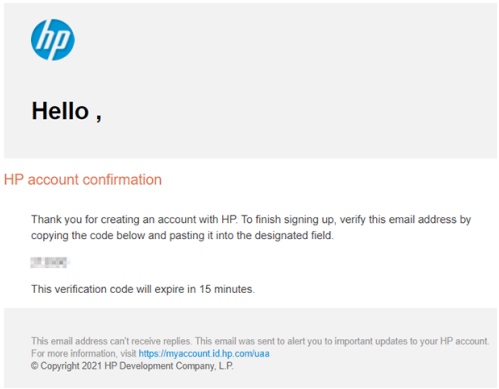
5. Tap **CREATE NEW HP ACCOUNT**.



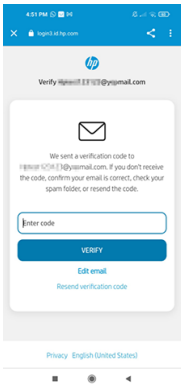
6. Enter your personal details.



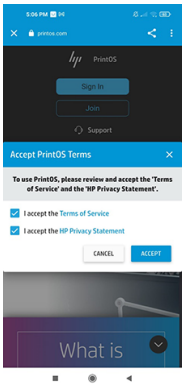
7. HP will send you a verification code by email.



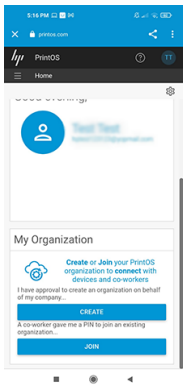
8. Enter the code in the PrintOS app.



9. Accept HP's terms of service and privacy statement.



10. Now you can create a new organization, or join an existing one, to add your printer.



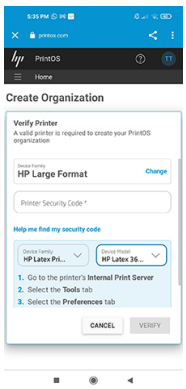
Create an organization

If your organization is not already registered in PrintOS, you must create it.

1. After tapping **CREATE**, tap **HP Large Format**.



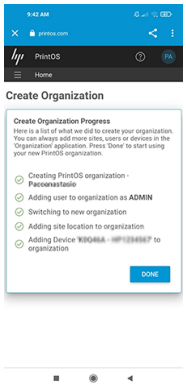
2. Enter your printer's security code.



3. Create your organization.



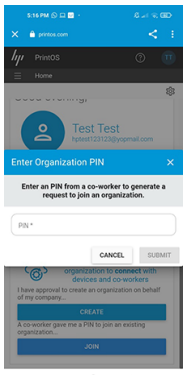
4. Congratulations, you have created your organization and added your printer.



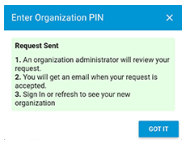
Join an existing organization

If your organization is already registered in PrintOS, you can join it.

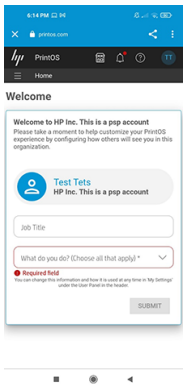
1. After tapping **JOIN**, ask another member of your organization for the organization's PIN, and enter it here.



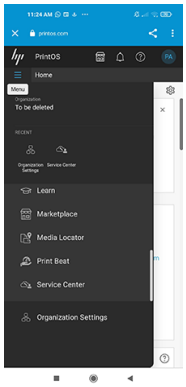
2. Tap **GOT IT**.



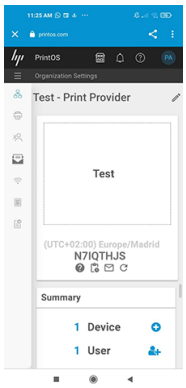
3. Wait until your request is accepted, then create your profile.



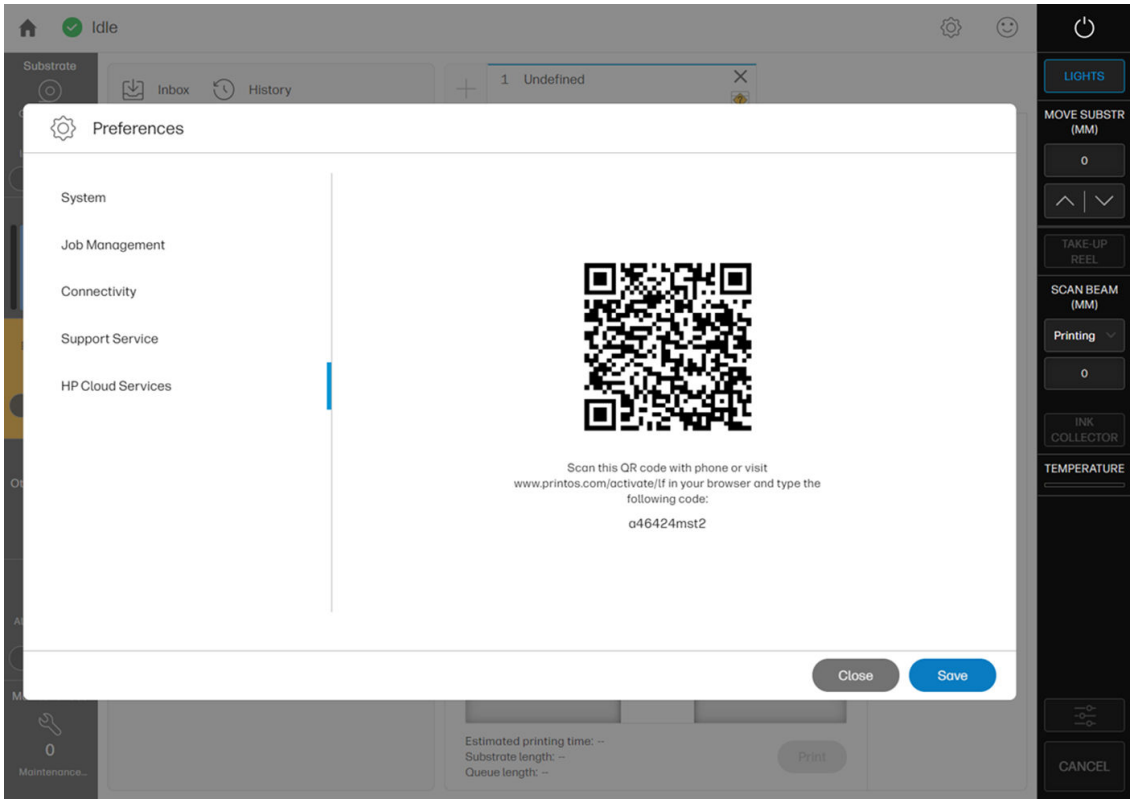
4. Tap **Organization Settings**.



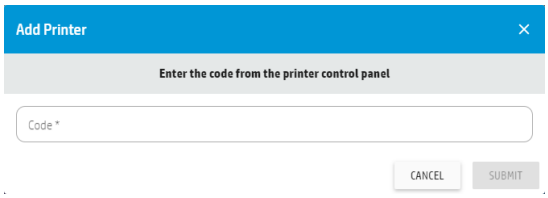
5. Tap the plus icon ⊕ to the right of **Device**.



6. Your printer now generates a QR code and is ready to be added to PrintOS directly from your mobile device. Scan the QR code with your smartphone or tablet using either the camera or a QR scanner app.



Alternatively, you can go to https://www.printos.com/activate/lf/ and activate your printer with a security code, found in the previous QR code generation section.

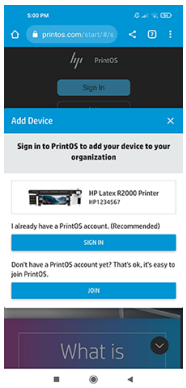


7. Now proceed to Register and connect your device when you already have an account on page 328 to register your printer with PrintOS.

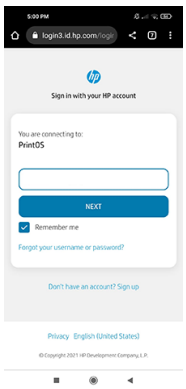
Register and connect your device when you already have an account

In order to use PrintOS, first you have to connect your device.

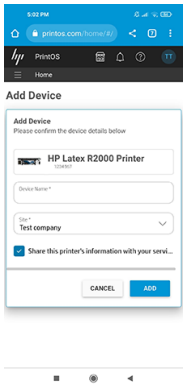
1. Tap **SIGN IN**.



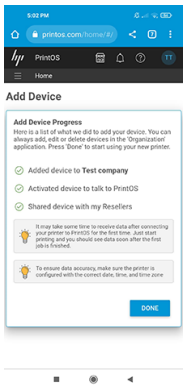
2. Enter your credentials.



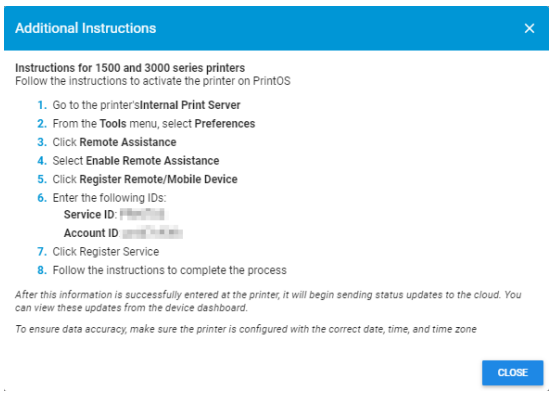
3. Add details of your printer.



4. Tap **DONE**.



5. Follow the instructions you are given to activate your printer on PrintOS.



Activate your printer warranty

When you have registered your printer in PrintOS, it is time to activate your warranty.

To do this, you will need to complete the End Of Installation Survey, which is usually done during the installation of a new printer with the help of your HP Certified Partner or installer.

Otherwise, contact your local provider for help with this step. If you have any questions, you can contact your HP Channel Partner, or HP PrintOS Support at https://www.printos.com/start/#/support/.

HP Service Center

The Service Center app is a service delivery tool, part of the PrintOS platform, that enables you to receive a better support experience and helps you to optimize your daily tasks, reducing costs and delivery times.

In order to take advantage of Service Center capabilities, the customer and partner organizations need to be linked in PrintOS.

What you can do with Service Center

- Request support from HP and your HP Certified Partner
- Open new cases

Open a support case at HP PrintOS

If HP Proactive Support is enabled in your printer, Automatic Case Creation will be generated at PrintOS. The information about your case will already be in the HP support system, simplifying and accelerating the support activity.

Automatic Case Creation is available and has been implemented in the Web and mobile versions of Service Center.

- If you accepted the invitation to HP PrintOS sent to you during the installation of your printer, you can open a case at PrintOS.
- If you did not accept the invitation to HP PrintOS during installation, you can register your printer now at http://www.printos.com/, and HP PrintOS for PSP mobile app at https://printosmobile.carrd.co/?_branch_match_id=938065113769545607.

Figure 17-3 PrintOS for PSP mobile app



Figure 17-4 Monitor your site's performance in the palm of your hand

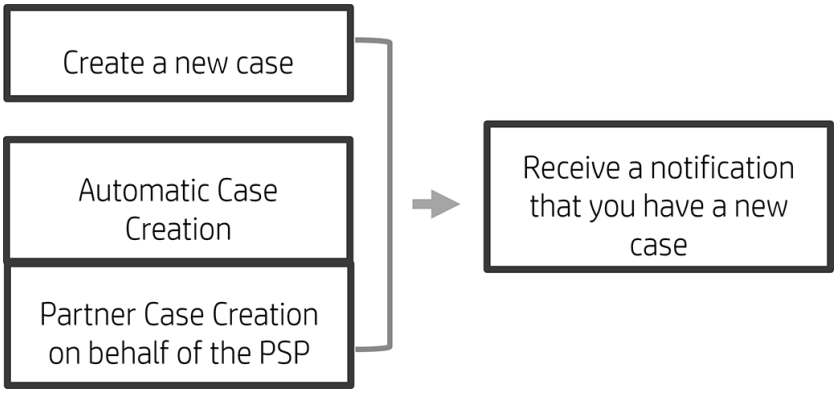


Watch how to track cases through Service Center for PSP, at https://lkc.hp.com/blog/how-use-service-center-open-track-cases/.

IMPORTANT: Cases can be opened only for printers under warranty or contract and with their location configured.

Case creation workflow

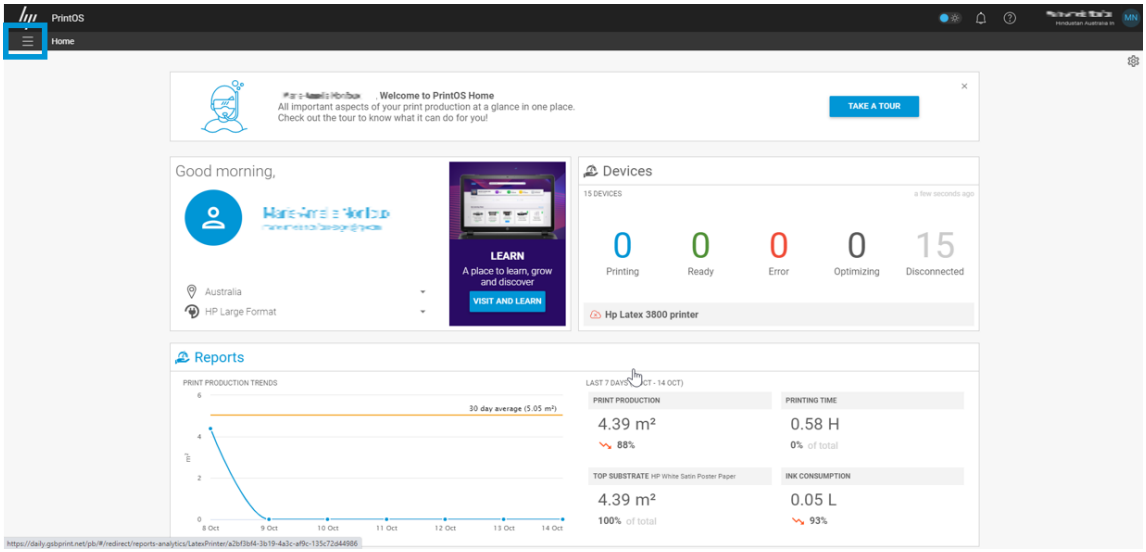
All case activities are stored in Service Center.



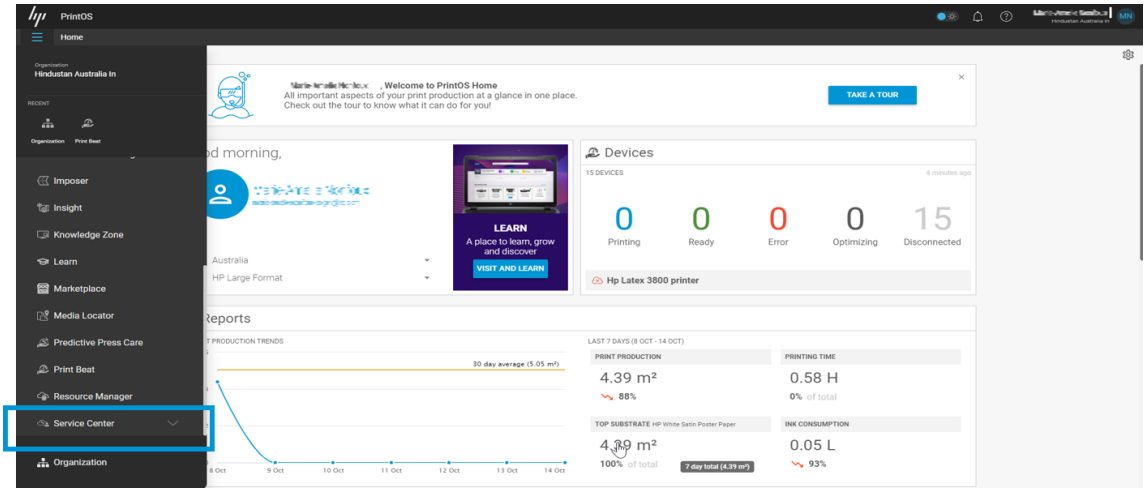
How to create a new case

Create a new case in PrintOS.

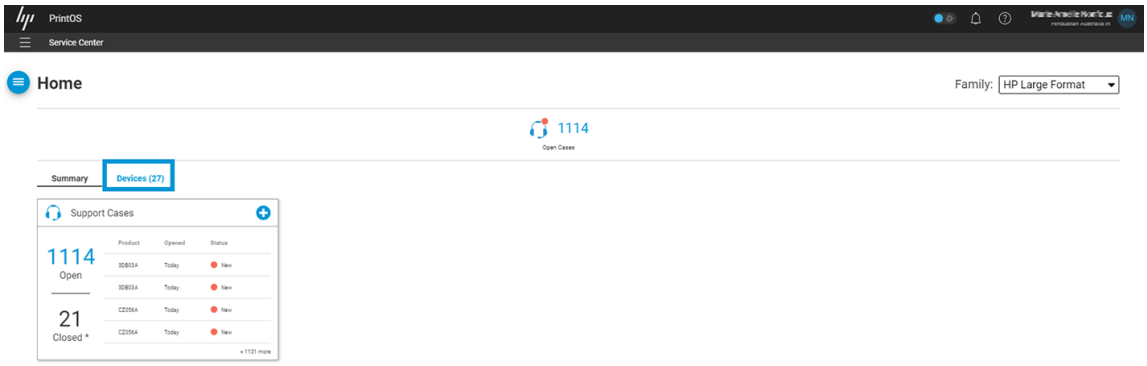
1. Tap the menu icon to open the side menu.



2. Tap **Service Center** to access the information.



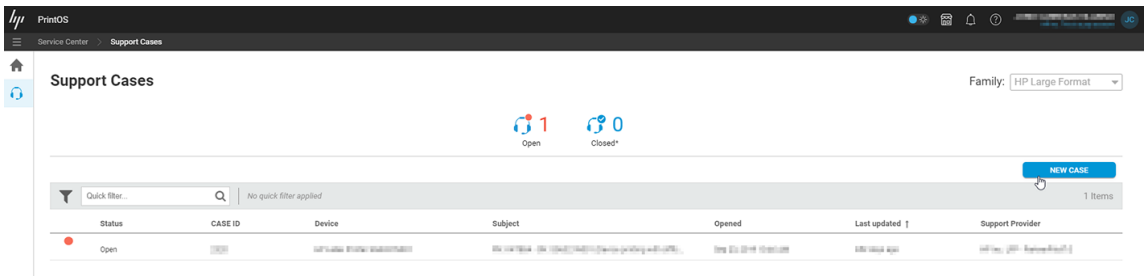
3. Tap **Devices** to see the list of registered devices.



4. Choose one printer from the list, then tap **Open Cases** to see the list of support cases for that printer.



5. Tap **NEW CASE** to create a new case.



Automatic Case Creation option

Your printer may or may not be capable of Automatic Case Creation.

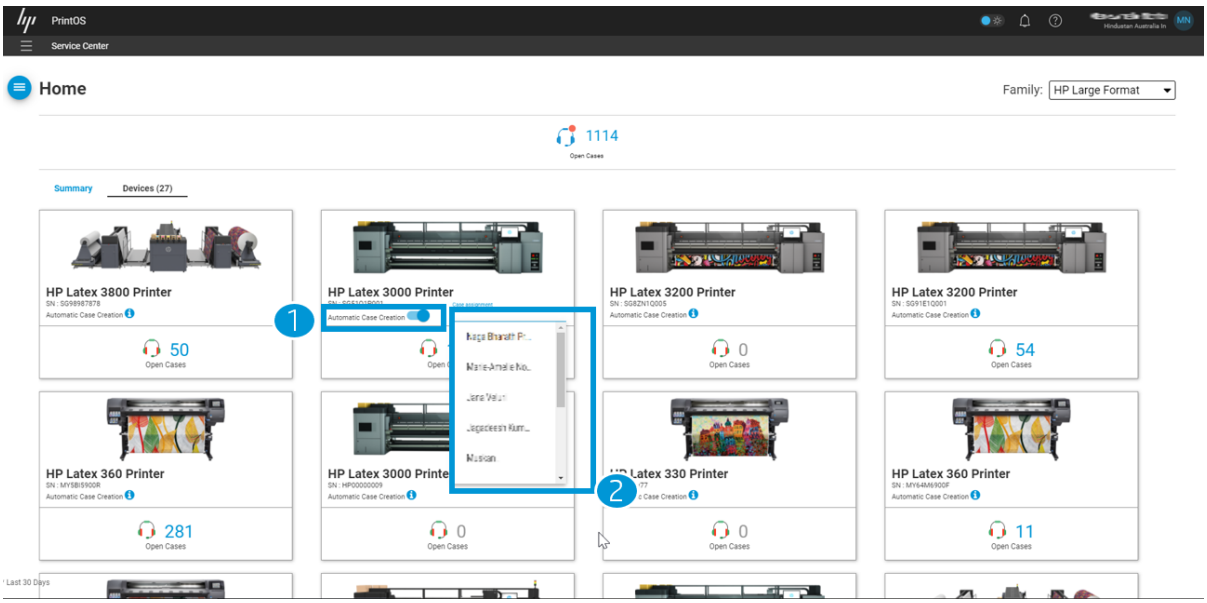
- If your printer is not capable of Automatic Case Creation, then the option will not be available. For further information, contact your service representative.



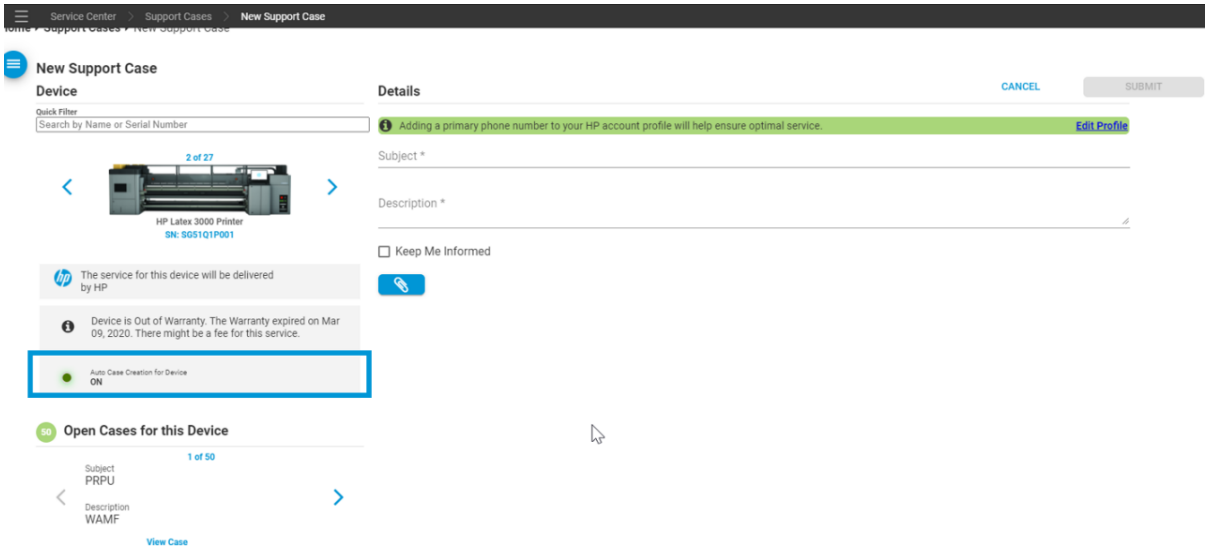
- If your printer is capable of Automatic Case Creation, it is activated by default, with the admin account as the case owner. But you can change the case owner or deactivate the option.



If Automatic Case Creation has been deactivated, you can activate it by sliding the button and selecting the case owner.



When opening a new case, you can see whether Automatic Case Creation is activated for this device.



Partner case creation on behalf of the customer

Your HP Channel Partner can create a case proactively when Proactive Support is enabled or reactively when there is already an issue to solve.

For more information about Proactive Support, see HP Proactive Support on page 335.

If you have further questions, contact your HP Channel Partner, or HP PrintOS Support at https://www.printos.com/start/#/support/.

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.

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.

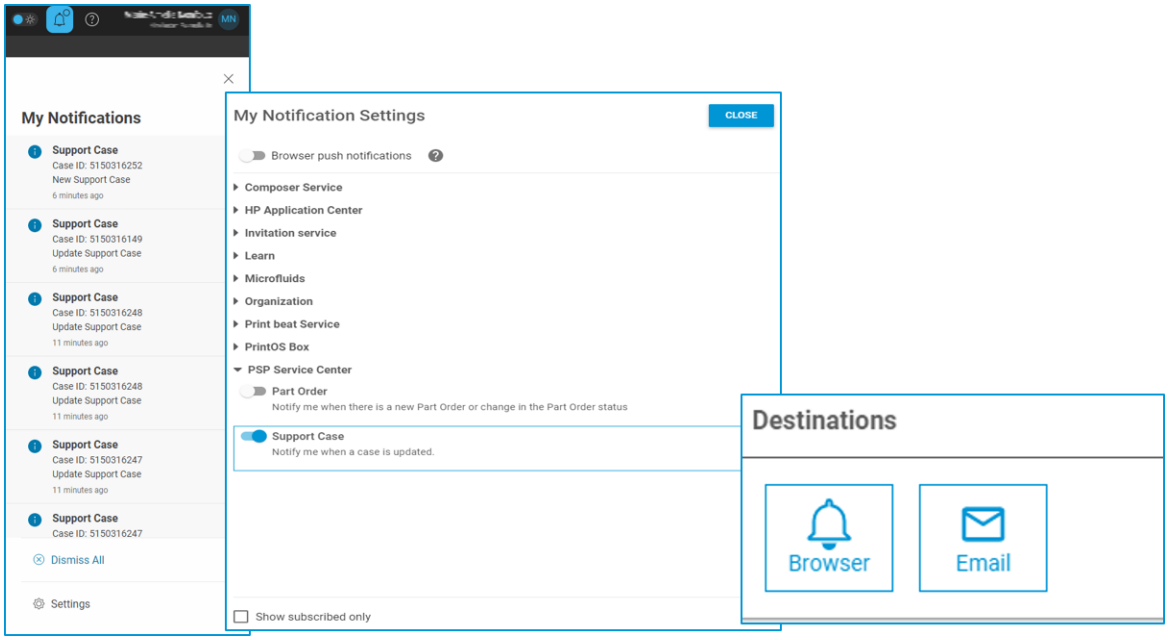
In order to enable Proactive Support, you first have to accept the Data Sharing Agreement by tapping **Preferences** > **Connectivity** > **Remote assistance** > **Accept**.

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.

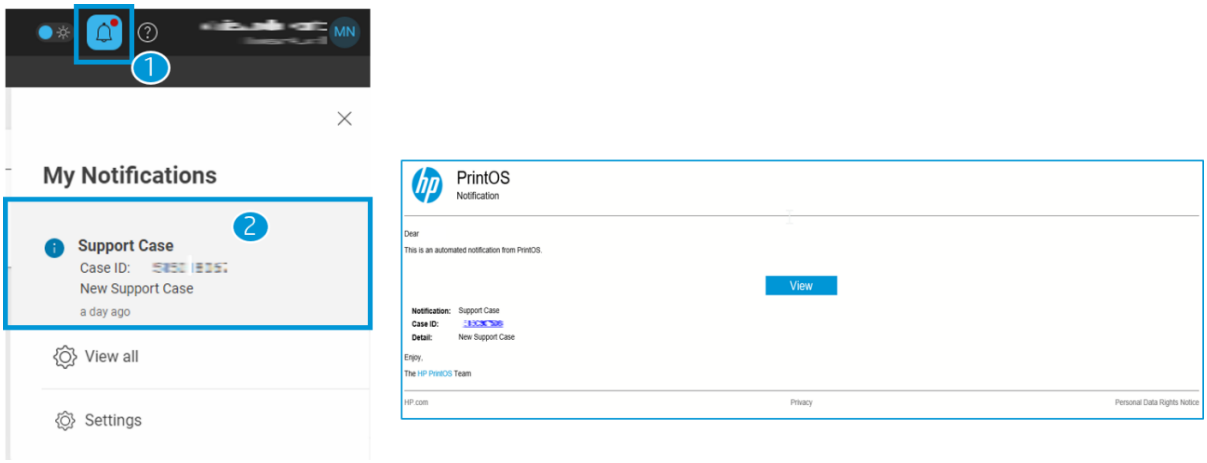
Notifications

You can choose to be notified about new cases created and new information about existing cases.

To enable notifications, tap **My Notifications** > **Settings**. Enable case-related notifications and select where to receive them.



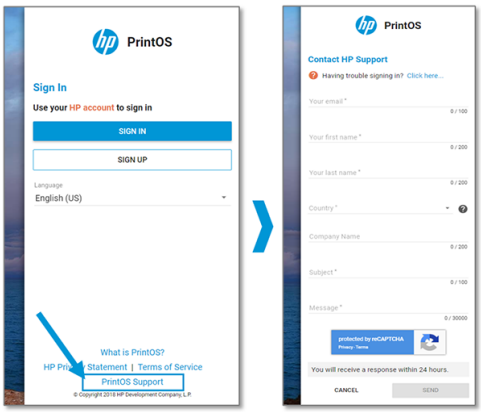
You will see your notifications in your browser and by email.



Accessing PrintOS technical support

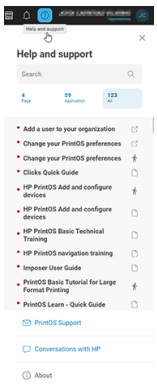
If you have any question, doubt, or issue related to the PrintOS app, you can find support and solutions by contacting PrintOS technical support.

If you cannot access PrintOS:

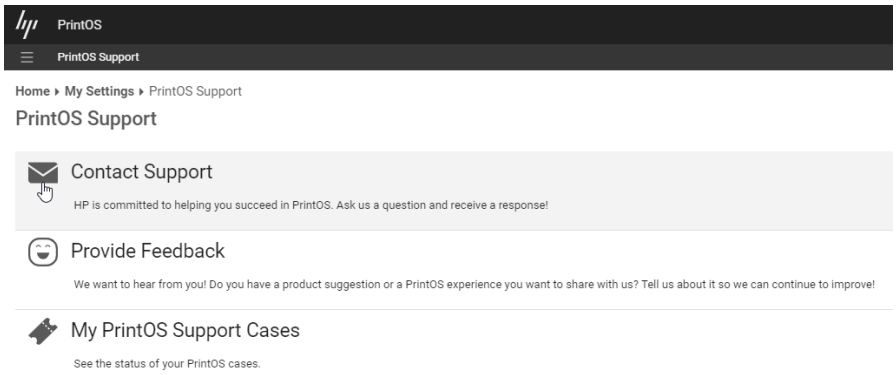


If you can access PrintOS:

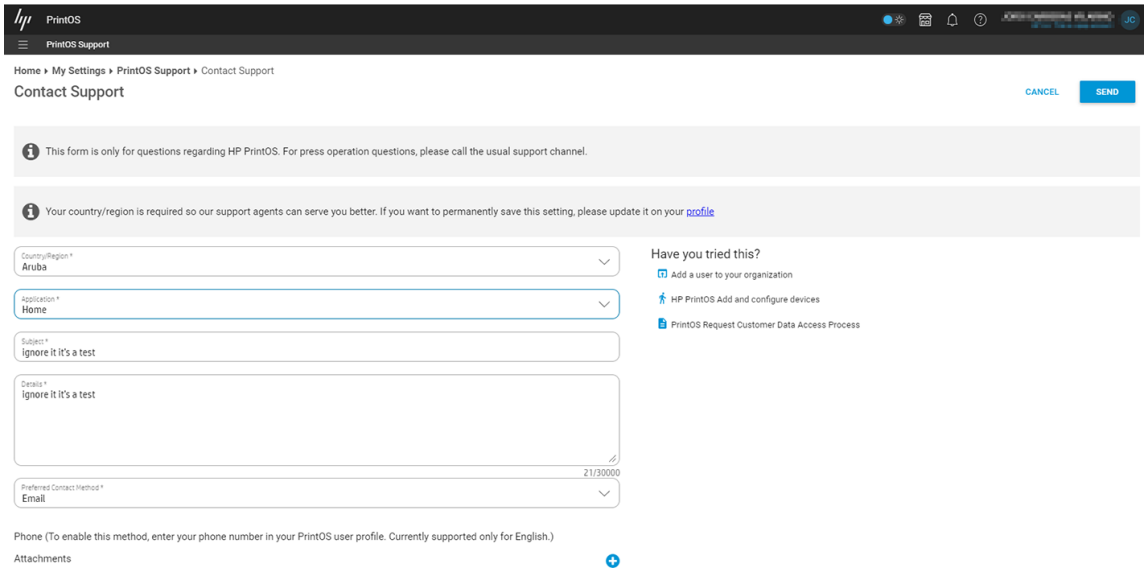
1. Tap the **Help and support** icon , then **PrintOS Support**.



2. Tap **Contact Support**.



3. Complete the form with your concerns and tap **SEND**. Remember to attach supporting information such as screenshots or PDF files, if relevant. Be as specific as possible and provide all the details that you have.



Accessing the PrintOS Learn app

Learn is a useful tool to learn more about the PrintOS app: the central learning platform for your print organization. It is already in your PrintOS account.

Learn can help you in the following ways:

- Increase your productivity and business success with knowledgeable employees
- Easily track your operator's learning performance
- Personalized and continuous learning
- Accessible anywhere, anytime, at your own pace

Powered by:

- E-learnings
- Videos
- Webinars
- Instructor-led teaching

IMPORTANT: If you do not yet have a PrintOS account, see Register your organization and printers in PrintOS on page 318.

You can also use PrintOS to monitor production, manage jobs, and gain valuable insight into how to optimize operations and increase productivity.

1. Sign into your PrintOS account: http://www.printos.com/.
2. Access **Learn** from the PrintOS App Switcher.

3. Start learning and increasing your knowledge.
4. From the Help menu, you can launch a tour of the Learn app to discover what it can do.

For more information about the Learn app, see
https://www.printos.com/home/#/help/f3202568-b11f-4fc4-a50d-886244e425cb.

18 Printer specifications

You can use your printer to print signs and graphics on a wide range of flexible materials up to 3.2 m (126 in) in width. It uses water-based HP Latex inks to provide high-quality, durable output.

Functional specifications

This topic provides a full set of reference information for this subject.

Table 18-1 Ink supplies

Type	Items
Printheads	Universal, optimizer, white (2700W and FS50 W/FS60 W only)
Ink cartridges	Cyan, magenta, yellow, black, light cyan, light magenta, overcoat, optimizer, white (2700W and FS50 W/FS60 W only)

Table 18-2 Substrate sizes

Measurement	Minimum	Maximum
Roll width	635 mm (25 in)	3.20 m (126 in)
Dual-roll width	635 mm (25 in)	2 × 1.60 m (2 × 63 in)
Jumbo-dual-roll width	635 mm (25 in)	2 × 1.52 m (2 × 60 in)
Roll diameter	80 mm (3.15 in)	300 mm (11.8 in) 400 mm (15.75 in) with diverter roller
Roll weight	-	300 kg (661 lb)
Dual-roll weight	-	2 × 70 kg (2 × 154 lb)
Jumbo-dual-roll weight	-	2 × 200 kg (2 × 441 lb)

NOTE: Narrow substrates can be damaged during printing if they are very weak.

Table 18-3 Passes, resolutions, and speeds

Passes	Ink density	Resolution (ppi)		Printing speed (m²/h)	Printing speed (ft²/h)
		Rendering	Printing	3.2 m roll	126 inch roll
2	≤ 70%	300 × 300	600 × 1200	121	1310
3	≤ 90%	300 × 300	600 × 1200	89	955
4	≤ 120%	600 × 600	600 × 1200	69	745
6	≤ 140%	600 × 600	600 × 1200	49	530
8	≤ 170%	600 × 600	600 × 1200	38	410

Table 18-3 Passes, resolutions, and speeds (continued)

Passes	Ink density	Resolution (ppi)		Printing speed (m²/h)	Printing speed (ft²/h)
		Rendering	Printing	3.2 m roll	126 inch roll
10	≤ 230%	600 × 600	600 × 1200	29	310
12	≤ 260%	600 × 600	600 × 1200	24	260
20	≤ 120%	600 × 600	1200 × 1200	10	110

Table 18-4 Standard print modes

Print mode name	Viewing distance	Print mode	Printing speed (m²/h)	Printing speed (ft²/h)
Backlit	1–3 m	8p 6c 150% 8p 6c 170%	38	410
High-quality backlit	1–3 m	10p 6c 150%	29	310
High quality (porous textile)	1–3 m	10p 6c 170%	29	310
High quality (SAV, textile)	1–3 m	8p 6c 130% 8p 6c 120%	38	410
Quality signage (SAV, synthetic, wallpaper)	1–3 m	6p 6c 100% 6p 6c 120%	49	530
Indoor signage (textile, woven wallpaper, HP Photo Realistic)	1–3 m	6p 6c 130% 6p 6c 100% 6p 6c 90%	49	530
Indoor signage (canvas, PET, banner, SAV, synthetic, non-woven wallpaper)	1–3 m	4p 6c 110% 4p 6c 100% 4p 6c 90% 4p 6c 80%	69	745
Outdoor signage (banner, paper, SAV)	3–5 m	3p 6c 90%	89	955
Fast (banner)	> 5 m	2p 6c 70%	121	1310

NOTE: Printing speed is measured using rolls 3.2 m (126 in) wide.

Physical specifications

The weight and dimensions of the printer.

Table 18-5 Printer physical specifications

Measurement	Value
Weight	1300 kg (2866 lb)

Table 18-5 Printer physical specifications (continued)

Measurement	Value
Width	5.72 m (225.2 in)
Depth	1.37 m (53.9 in)
Height	1.53 m (60.2 in)

Memory specifications

This topic provides a full set of reference information for this subject.

Table 18-6 Memory specifications for the Internal Print Server computer

Type	Capacity
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).

Table 18-7 Power specifications for drying and curing components

Description	Specifications
Mains power, input rated current	
3-phase (line-to-line voltage)	200–240 V AC, 50/60 Hz, 56 A max
3-phase (line-to-line voltage)	380–415 V AC, 50/60Hz, 35 A max
PC power (optional), input rated current	
1-phase	100–127 V AC, 50/60Hz, 10 max
1-phase	200–240 V AC, 50/60Hz, 10 max

Power consumption

This topic explains the power consumption.

Table 18-8 Power consumption

Status	Consumption
Ready	510 W
Printing or production	12-13 kW (typically)
Low power mode	110 W
Shutdown	95 W

Air supply requirements (pneumatic spindle)

The pneumatic spindle requires an air compressor or a pressurized air line, not supplied with the printer.

Air pressure supply

You are recommended to use a pressure gauge that indicates the pressure in bars.

Table 18-9 **Air supply specifications**

Item	Specifications
Air pressure	5.5 bar (80 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

Environmental specifications

This topic provides a full set of reference information for this subject.

Table 18-10 **Printer environmental specifications**

Conditions	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
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.

Acoustic specifications

Declared noise emission levels. Sound pressure level corresponding to the bystander position with maximum noise level according to ISO11202.

Table 18-11 Printer acoustic specifications

Characteristic	Specification
Idle sound pressure level at bystander position	58 dB (A)
Operating sound pressure level at bystander position	71 dB (A)

A 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.

Predefined substrate settings

This topic provides a full set of reference information for this subject.

Table A-1 **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

This topic explains the concepts involved in this subject.

- 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.
- 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.
- Use a Clear Sheet substrate preset from the RIP software.
- 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

This topic explains the concepts involved in this subject.

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.

Papers

Also known as: cover stock, paperboard, pasteboard, tag board

- 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.
- 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.
- Use gloves to avoid transferring fingerprints and oils to the print surface.
- Use caution when lifting it off the table to avoid creases.

Textiles

This topic explains the concepts involved in this subject.

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 **Textile** 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 a Textile 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 303.
- 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 **PET Film** 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 PET Film 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.

B Print-quality-troubleshooting summary table

This topic provides a full set of reference information for this subject.

Table B-1 Print-quality issues

Settings	Bleed	Coalescence	Poor curing	Vertical gloss dotted banding	Burnishing	Smudge	Content-dependent banding	Scratch
Pre-treatment	▲*	▲	▼*	▼*				
Drying	▲*	▼*	▲*		▲*			
Curing			▲*		▲*	▲*		▲*
Density	▼					▼		
Passes	▲		▲		▲	▲	▲	▲
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

See Advanced print-quality troubleshooting on page 291 for further information.

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.

MSS

The Movable Slot System.

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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