

HP Latex 700/ 800 Series

TECHNICAL BULLETIN



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Confidentiality: Restricted (Service) – HP Workforce + Channel Partners

Media Loading Techniques / Best Practices

Scope

This document explains best practices for media loading, positioning, and minimizing lead-edge waste, for the purpose of minimizing the frequency of carriage crashes and ink smears. We will also examine the potential for ‘cascaded’ effects from these events, and the range of benefits accrued from adherence to best practices.

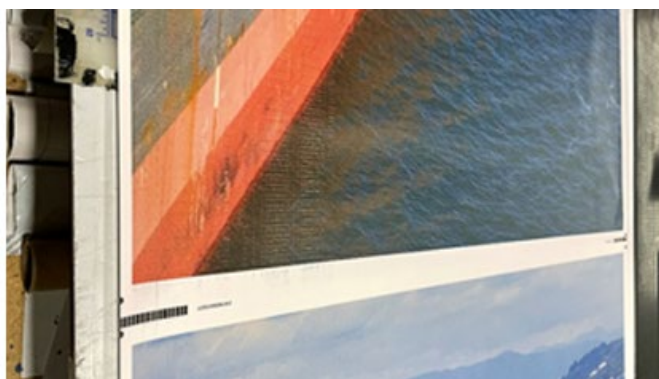
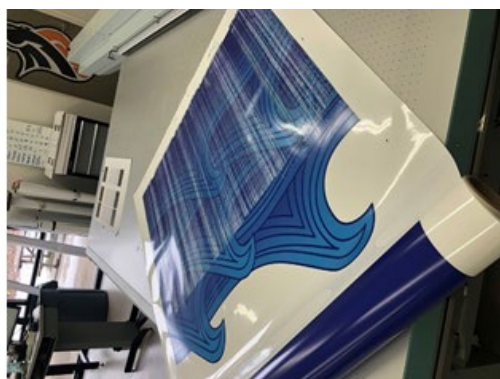
Issue Description

Carriage Crashes

Carriage crashes can be defined as significant physical contact between the carriage and either the media, or the media edge holders. When the carriage encounters either, the chances of a successful print diminish significantly. Carriage crash events typically occur most commonly during printing of the first job after loading a roll of media but can occur at any point. More severe crash events can result in media wrinkling, tearing, or balling up. Any of these will result in the job being wasted, and in more severe crash events, the printer will also require a reboot, which takes additional time. The worst-case scenario, typically only seen with a significant number of repeated severe crash events would be damage to the printer that could require a service intervention to resolve.

Ink Smears

Ink smears occur when wet ink comes into physical contact with something before the ink has completed curing. The two possibilities for ink smears are for the contact to occur in the print zone (with contact between the carriage and the media) or in the curing zone (where the media is raising and encountering the top/ roof of the curing unit). This results in wet ink smears on the media and can also lead to ink transfer onto the curing unit itself. The latter is more often the case.



Ink Smears

These topics are not new or unique to the Latex 700/ 800 Series. In fact, there have been issues related to media loading technique with all four generations of low-volume HP Latex printers dating back to the L25500 in 2009. With all generations of HP Latex printers, there has been a benefit to ‘front tension’ (aka ‘forward tension’) on the media

when printing. This is largely due to the unique nature of the HP Latex media path (front loading and front unloading), and the presence of the curing unit.

It is also important that distinctions be made between crash events and ink smears. This is the case because, while the two can be sometimes related to each other, they are not interchangeable. For example, ink smears can result in media advance issues, which can ultimately result in a crash, but the solution in this scenario would be to avoid the ink smear, which will prevent the resulting crash from occurring.

Carriage Crashes

Carriage crash events occur most often in the first plot after loading a roll of media, or after an x-cut of the media. The most common scenario are crashes which occur while the media lead edge is in the print zone or is passing through the curing unit. Once the media lead edge has advanced out of the printer and exited the curing unit, the frequency of media crash events diminishes rapidly. As the media advances out of the curing unit, the media moves toward the floor, or onto the take-up reel, creating front tension on the media. This front tension promotes smooth media advance, making it more difficult for the media to catch or hang up in the printer. Once the first several linear feet of media have been printed and cured and have advanced out of the cure unit, the chances of a crash event decrease significantly.

Ink Smears

Ink smears are a different issue from crashes, although, as mentioned, ink smears can end up causing crashes. Ink smears are caused from media advance issues, either in the print zone, or the curing zone. Unlike crash events, ink smears can occur at any point in the roll, and not necessarily in the initial several feet of printing.

The first step in diagnosing ink smears is to determine whether the ink smear is coming from the carriage, or from contact with the curing unit. Ink smears from carriage contact will be visible through the acrylic window into the print zone but contact in the curing unit is typically obstructed from view by the curing door/ curtain.

Media Loading Options

There are two basic choices for media loading on the 700/ 800 Series printers:

- Auto Load (pinches down)
- Manual Load (pinches up)

For medias that have a clean and straight lead edge, either the Auto load or Manual load option may work well. The Auto load option grabs the media and attempts to advance it through the pinch rollers, checks the width of the media, and checks for media straightness.

Manual load raises the pinch rollers, and the front panel prompts the user to advance the media to the front edge of the print platen, tap the Continue Button on the front panel, and then lower the cure unit. Next, the operator is prompted to advance the media through the cure unit and check for/ correct for skew. The last step in the Manual load is to enter the media width at the front panel.

After completing the load (using Auto load), the media's lead edge is typically located adjacent to the pinch rollers at the entrance to the print zone. When using Manual load, the media's lead edge is typically located outside of the front of the cure unit. The media can be advanced or retracted from the Home screen at the front panel.

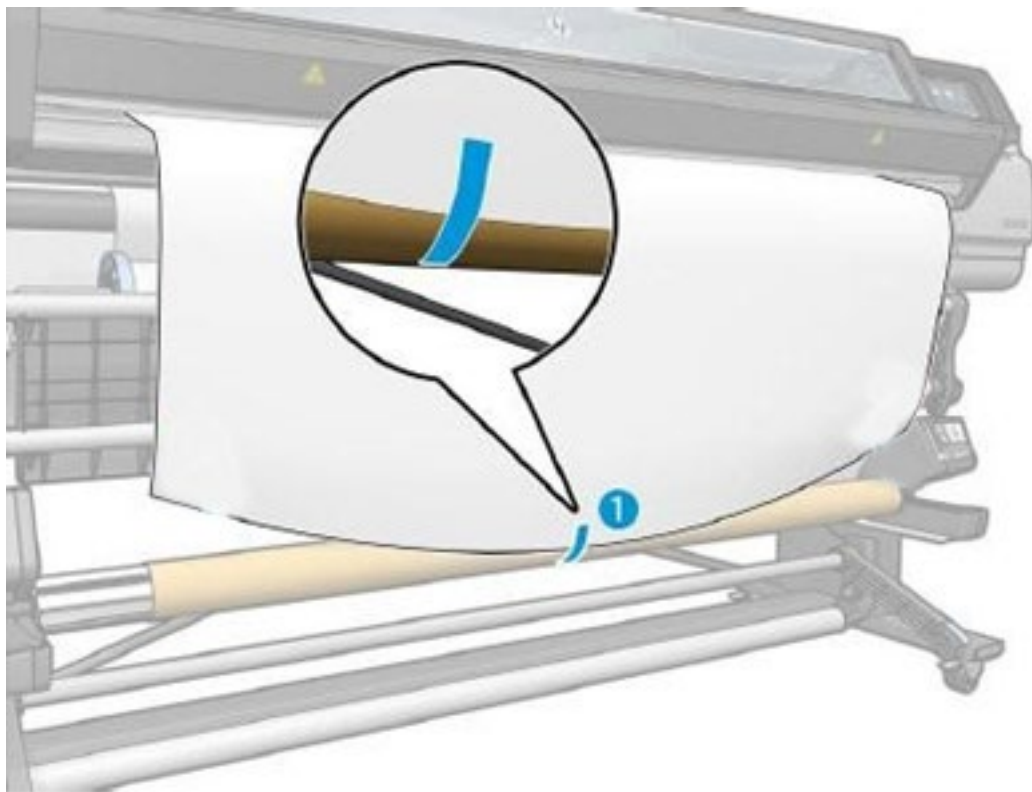
There are potential advantages as well as downsides to printing from the pinch rollers. There are some medias, such as specific cast vinyl medias, which can print reliably from the pinches, with the lead edge positioned in the print zone at the start of the print. The potential benefit of this practice would be a slightly increased media yield, with less unprinted lead-edge media being consumed. The downside of this practice is that there can be a higher frequency of carriage crashes and ink smears which occur most often in the first print. Some medias are not recommended to print from the pinches, including banner vinyl, polymeric SAV, most films, and static cling medias. These medias tend not to print reliably without crashes or ink smears.

A major crash event will require that the printer be powered down, the media manually removed, and the printer rebooted from a cold start. This entire sequence can take between 5 and 15 minutes to complete – and this is in addition to the media and ink waste that occurs in a crash or smear event, as well as the time to reprint the job.

Lead Edge Positioning

Because of this, it is desirable to avoid crashes and smears to the extent possible. This requires the introduction of a key construct called Forward (aka front) Tension. Forward tension can come from several sources, but the easiest way to increase forward tension is to manually advance the media from the front panel so that the lead edge of the media is outside of the curing door, with the front edge visible when the door is closed. This practice helps to ensure that there is no opportunity for the lead edge of the media to catch or hang up on a feature inside of the printer.

When the job begins to print and the media advances from this point, the amount of front tension increases due to the mass and weight of the media pulling the media forward through the printer down toward the floor. It is also possible to secure the media lead edge directly to the take-up reel before beginning to print – this is a recommended practice for multi- tile jobs.

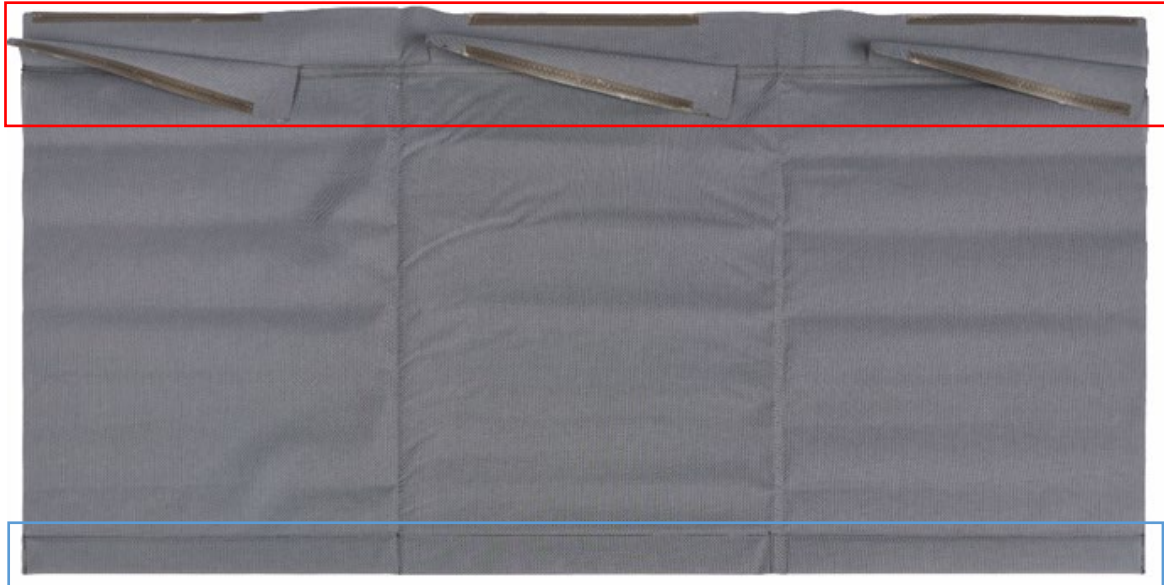


Direct Attach to TUR

This provides forward tension from two sources: the media itself, as well as the TUR (depending on the TUR mode being used). We generally recommend using a single point of adhesion at the direct middle of the media as shown. For example, on a 54-inch-wide roll, the tape would be placed dead center, at 27 inches from each side). One additional recommendation is to cut a curve or bevels at the lead edge. This helps the TUR collect the media without wrinkling the media.

On the Latex 700/ 800 Series, advancing the media outside of the curing unit door will consume around 30-inches of media at the lead edge per media load. Advancing the media lead edge to the TUR will consume around 48-inches per media load. It is important to keep in mind the cost of the media when considering what practice to use. For example, with a 60-inch wide standard 13oz scrim banner, lead edge media waste would equate to less than \$2 to bring the media outside of the cure door and around \$3 to take the media directly to the TUR (assumes a media cost of \$0.15 ft/2).

For more expensive media, such as cast vinyl, costs associated with these practices increase significantly. For this reason, HP manufactures a Media Feed Accessory (MFA). The Media Feed Accessory is intended to mitigate the lead edge waste issue when printing roll-to-floor. The MFA is secured to the media lead edge after the media loading sequence is complete. The accessory is made of woven nylon fabric and attaches to the media's lead edge via magnets (framed in red) located on one side.



Media Feed Accessory

Opposite the magnets are a series of weights (framed in blue) that produce significant forward tension when affixed on the media. After securing the MFA, the media is retracted into the printer, so that the media covers the print zone, and the MFA is positioned in the cure unit and the weights are outside of the printer, to provide forward tension on the media. The MFA should be used to minimize lead edge waste on the first several feet of printing after a media load. Use the accessory for the first print, and then remove it and affix the media to the TUR for subsequent prints. Lead edge waste when using the MFA should be 10-12 inches. Use of the MFA for the first print generally resolves both crash and smears in the first several feet of printing, but the accessory should be removed after the media has advanced.

Note: The Media Feed Accessory is not intended for use when printing roll-to-roll.

Ink Smears

In cases where dynamic friction between the media and the cure platen exceeds the front tension, the media can buckle inside of the cure unit, and this can result in ink smears. These buckles can occur inside of the cure unit, or at the interface between the print platen and the cure unit. This can be checked by unloading the media, and raising the cure unit, and inspecting the media entrance to the cure unit. If you see dried ink at the entrance to the cure unit, this is evidence that the media is buckling as described.

Output Platen Protector Accessory

There is another accessory available called the Output Platen Protector (OPP), which can be used to reduce dynamic friction between the media backing and the floor of the curing unit. The OPP is not required for all medias. It can be useful in cases where the media is not advancing smoothly through the cure unit due to friction between the media and the cure unit floor. The OPP is made from two materials, felt and nylon. When installed, at the entrance to the cure unit the OPP is made from felt, and midway through the cure unit the material changes to nylon. The OPP feeds through the curing door, wraps around the output roller, and secured to the outside bottom of the cure unit with Velcro.

There are some media categories which may not work well with the OPP installed. Some art canvas medias may run better without the OPP installed. In these cases, removing the OPP from the cure unit would be the recommendation.

Additional Techniques

As has been discussed, forward tension is beneficial to avoid crashes and ink smears.



Center Strap when printing R2R



Lead-edge media waste 6-12 inches with Center Strap

Additional Considerations

It is recommended to unload the media from the printer when not printing for a prolonged period, such as overnight or weekends when the printer will be unused. When left in the printer's media path, some medias develop 'shape memory' when left in the printer, and this can result in carriage strikes or smears in the next day's first print. Best practices include performing a media unload (under the Substrate Icon) at the end of each day's production.

Summary:

HP Latex 700/ 800 Series printers run most reliably when forward tension is being applied to the media. Forward tension promotes smoother media advance through the media path, including the print zone and curing unit.

Forward tension can come from the media itself (after it has advanced through the curing unit), or from an external device, such as the Media Feed Accessory or a Center Strap. The Media Feed Accessory is well suited to use on the first print when not using the take-up reel (printing roll-to-floor on the first job) and helps to minimize lead-edge media waste.

The Center Strap loading technique provides front tension for roll-to-roll printing and helps to minimize lead-edge

media waste. Cutting an arc or bevel into the lead edge helps to promote a clean wrap onto the take-up reel.

Minimizing media crash and ink smear events is a key with promoting greater consumables yields and efficiencies with the printer, reducing waste, and improve overall printer uptime. By avoiding ink smears and carriage crash events, a wide range of benefits can be realized:

- Elongate the effective life of printheads
- Reduce job preparation/ warm-up time
- Reduced potential for service issues/ increased uptime
- Improves the longevity of the Maintenance Cartridge