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WINDING FRAGILE LARGE FORMAT PRINTS WITH ARCHIVAL TISSUE

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Winding fragile large format prints with archival tissue

Abstract
Protecting large format printed jobs or proofs against damage, scratches, fingerprints is a challenge commonly faced by Print Service Providers or design agencies that is all the more acute as the prints may have to be transported from the printing area to the assembly workshop, to be stored until the assembly area is available or to be sent to third parties doing the finishing of the large format application.

This is particularly sensitive with inkjet large format prints done on fragile media such as fine arts media (in particular cotton-rag based), matte photo paper or backlit media.

We are describing here below a way of winding such prints onto a transportable roll during the printing process with archival tissue, whereby the tissue gets sandwiched over the print, the inked side of the print facing the protective tissue for best performance.

This is achieved taking advantage of the capability of printers like the DesignJet Z6dr and Z9+dr which support both dual roll and take-up reel functionalities. It also dramatically reduces the risk of winding creases that would happen if done manually, which is another failure often experienced through offline manual processes, causing scratches and pressure marks.

Proof of the concept

Equipment needed
- An DesignJet Z6dr 44” or an DesignJet Z9+dr 44” (key is the Dual Roll, “dr” element)
- A DesignJet 44” take-up reel, compatible with these printer models
- An empty 3” core carton tube, length preferably more than that of the width of the media roll to print on (with the exception when printing on full 44” width media). The prints and archival tissue will in essence be sandwiched around it, making smaller cores than 3” higher risk to negate some of the winding benefit.
- A roll of the matte media to print on (size between A1 and full 44”)
- A roll of unbuffered acid free archival tissue paper – the roll width of the archival tissue should be equal to or larger than that of the media to print on
- Thin easy to remove adhesive tape with glue that preferably does not transfer to the taped surface once removed

Description
- Install the take-up reel on the DesignJet Z6dr 44” and Z9+dr 44”
- Insert the 3” core tube onto the Take-Up Reel (TUR) spindle
- From the printer front panel, disable the horizontal cutter (this will also automatically disable the vertical trimmer of these dual roll models)
- Load on roll 1 the media to print on
- Load on roll 2 the archival tissue in the opposite way you would normally do if you were to print on it (on pulling down the tissue manually from the back of the printer you see the outer face of the roll).
Here one may need to include a free spinning roller accessory over the spindle bar, either instead of the usual blue core adapters, or linked to them. Leaving the tissue paper to freely roll forward off the spindle bar as it is pulled into the process, may generate backwards tension, forcing the tissue paper onto the printed surface (depending on the rolling direction). Although it is unlikely that this will generate pressure marks or fine scratches specifically on dark saturated surfaces, testing would need to be conducted to see if this part of the accessory would be required.

- Close the roll 2 cover and pull the archival tissue from the front bottom of the machine until it reaches the take-up reel spindle [Figure 1]
- Tape the tissue on the tube inserted on the take-up reel spindle, aligning the tissue against the right hand cap of the take-up reel [Figure 2]
- Start printing the series of jobs you want protected
- When the print is long enough to reach the take-up reel spindle with some slack, tape the top of form of the print to the tube, aligning it against the right hand cap of the take-up reel [Figure 3]
- Slot the loop shaper onto place on the take-up reel, behind the print [Figure 4]
- Press the winding button 1 on the take-up reel, it automatically stops with the tension of the print [Figure 5]

As the job keeps on printing, the printed media will wind around the carton tube together with the archival tissue, the inked side of the media facing the protective side of the tissue, Figure 6. The tube with wound print and tissue can later be removed from the take-up reel spindle for transportation or storage.

To be further investigated

- How to reduce waste at beginning and end of job
- Any better system than removable tape?

R&D needs

- Add an option for roll 2 to get free movement when the take-up reel pulls the archival tissue forward
- How to minimise skew roll 1 / roll 2 (especially if media and tissue are taped onto the tube)
Figure 1 – unwinding the archival tissue manually out of roll 2 towards the loaded empty core on the TUR spindle – ideally you should not see the outer side of the roll of tissue as in the photo going to the bottom of the empty core; revisiting the idea we have determined that the tissue should rather be going over top of the TUR when being loaded, hence receiving the print from underneath the empty core, since the printed paper returns to the TUR after the sway bar optimally to enter the sandwiching process following the natural curl on the paper this way.

Figure 2 – tape the issue onto the take-up reel spindle, aligning with the right cap of the spindle. As described under Figure 1, this taping would be different from these images, but in same principle attached to the empty core.
Figure 3—tape the leading edge of the print to the take-up reel spindle. Again as described in Figure 1, optimally this taping should then be done for TUR rolling direction to go underneath the empty core. Whether taped as in the image or underneath should make no difference once rolling starts. Likely taping it in a visible place like this image may assist in getting the leading edge fixed straight, where taping it underneath may complicate this part of the process. The risk of not fixing it as straight as possible is getting folding creases in the tissue, however tolerance here should be fairly high, making the fixing/taping a fairly robust and easy process.

Figure 4—slot the loop shaper onto place, behind the printed media
Figure 5— set the TUR to wind the media counter-clockwise by using setting 2 on the TUR, which is the exact opposite of what is shown in the image on the right.

Figure 6— the TUR in essence sandwiches the print into the archival tissue around the carton tube. Another reason why the winding cannot be done as shown in this image, is the goal is to handle very sensitive printed material and imaging layers on matte surfaces. Hence you have to minimize the number of print surface contacts with anything during the winding process. This image shows how the surface goes against the natural curl of the paper, causing additional pressure on top of the pressure caused from the winding against the weight of the sway bar. Due to the goal being reduction of pressure, testing may need to be done without the sway bar in place as well. This may cause the winding to be very loose, however this should not cause any concern with fine art printers, who are used to doing this manually in any case in order to preserve the integrity of the printed surface.