PRINT SPEED BENCHMARKING OF SCANNING PRINTING PRODUCTS

Overview

In the Wide Format Print industry one of the things that brings the most confusion
is the process used to estimate and measure print speeds of conceptual designs and finished products. This document outlines the process used to by Novus Imaging to accomplish this. We feel strongly that accurate print and throughput speeds are important to the integrity of the development and sales process. The widely accepted process used by most companies is to state speeds while the product is running mid print. Unfortunately this is not a real world representation of true print speeds. True print speeds include the amount of time and or passes needed to start and complete the image. This adds time to the printing process and slows the throughput of the product.

Image size

To accommodate this Loss of efficiencies in a scanning printer application one
must first decide the length of the image to be bench marked. Simply stated this is because the amount of time spent in the inefficiencies of starting and completing the image can greatly skew the total time as it relates to the square area of the actual print. One must also consider the width of the image. Because each image typically printed is of different widths and there is also inefficiencies in the time it takes to accelerate the carriage to print speed, decelerate the carriage to turn it around and re-accelerate the carriage to return it to the print area. One must also consider the width of the actual print carriage as this must also be fully past the print area before the carriage can be decelerated and stopped for turn around. Now given all of these considerations the best way to state accurate print speeds in a realistic light is the pick a print width equal to the maximum width of image that the printer can accommodate and a print width that is equal to that length. If the actual image is narrower or shorter it is clear that the throughput speeds will suffer. THIS POINT SHOULD NOT BE OVERLOOKED.

Print modes

Another point that must be considered is the print mode and quality of the bench marked speeds. Some companies state the up to speeds for modes that are, in most application expectations, un-sellable. Others choose modes that will degrade as the printer mechanism wears in over normal usage. These mode tend to be of lesser resolution that look "marginally acceptable" while the printer is new but degrade quickly. Novus Imaging considers that any stated print speed must be for a sellable mode. We feel that the best way to state these modes is as Speed, Production
and Quality modes. Speed modes are primarily used for quick signage where quality is not the primary concern. Production modes are modes that will be acceptable in 80% of the applications / markets but will not degrade significantly as the printer ages. Quality modes are modes that will be acceptable in 100% of the intended applications / markets for a particular printer and will also not degrade as the printer ages.

Single copy speeds

Single Copy print speeds represent the time, and hence the speed, that a single
copy of the print can be completed.

Continuous print speeds

Continuous Print Speeds represent the time, and hence the speed, that a printer
can print multiple copies of a print if it is equipped with a continuous print mode. When considering a printer with a continuous print mode, the first print off on a continuous run will effectively run at the Single Copy Speed. The remaining prints will continue to run at the Continuous Print Speeds. Continuous Print Modes are estimated considering images printed on a continuous roll of material and with zero margin or space between images.

Estimated speeds

When printers are in the design concept phase a mathematical model is used to estimate print speeds of the given modes. The thing to consider when using these models is that they can vary by as much as 10% from the actual print speeds with small input changes like turnaround pauses and data throughput. Because the real world can sometimes be unpredictable these small changes can affect the actual speeds a significantly.

Up to speeds

When Printer Manufacturers state speeds they will always state the speeds with
an "Up To" caveat. As they should. This again is because when you are dealing with printers in the real world there are many factors that can affect speeds and the ideal speeds, although they are the norm, reality states that they may not always be realized.

Other considerations

As mentioned above there are many factors that can degrade print speed. Most of these factors may seem obvious but should be stated anyway.

- Carriage Speeds: Often the carriage speed for most printers is selectable to provide different levels of image edge definition and text quality. Most of the time the rated speeds will be given at the maximum carriage speed which will not always be practical for some jobs.

- Hard Disk Drives: One thing that is often over looked is the fact that these images are stored and printed from Rotating Media, (hard drives) and as with any disk file system the more information that is stored on the drive the slower the seek rates will be. Just because you have 2TB of storage on a printer does not mean you should use all of it! Store your image files in a secure Network Accessible (NAS) device and only put your immediate jobs on the printer.

- Network Speeds: NEVER attempt to print an image stored on another networked printer. This will almost always give you inconsistent results. Network speeds will also adversely affect the time it takes to transfer files. Production files can become quite large and transfer time should always be considered.

- Other Software: It is very convenient that with today's computer hardware developers can use commercial operating systems now including windows and Linux. The danger comes in the fact that operators can place other applications not related to the operation of the printer on the print server. There is no reason to believe that asking the print server to stream music, play videos surf the web, or video games will not adversely affect print performance.

Conclusion

Given all of these considerations one can see why the stated print speeds are basically a "marketing spin". We feel that the best way to put clients and customers at ease is to state speeds that are realistic, achievable, and sustainable. We feel that customers deserve to know what they can truly expect from our designs and although these faster print modes are available it would be tragic in our opinion for a customer to purchase a product based on a speed that will not deliver consistent sellable quality over time. Integrity to Novus Imaging is key to delivering the best customer experience possible and we feel it best to be at the forefront of that effort with clear concise print speed claims.