DIGITAL PHOTOGRAPHIC PRINTERS – How To Get The Final Results You're Looking For.

When considering the purchase of a new digital photographic printer, the following primary factors should be evaluated

- Image quality.
- Production speed.
- Cost.

While these three factors are vitally important to any purchasing decision, they are not the only ones.

For example, an often overlooked consideration is the decision whether the workflow is to be modular or cellular. Scalability and flexibility issues also must be addressed. Individual portrait production, proof printing, package printing, specialty items, custom portraiture/commercial printing, and quantity printing are all examples of different workflows that have different requirements.

■ Different Types Of Current Printer Technologies.

As is the case with all technologies, be careful of "specs-man-ship." Looking at the numbers may not provide conclusive proof. Remember, that resolution and overall print quality are only two factors in the equation. Making representative samples is a better method of image quality validation.

CRT

- *Area CRT* – variable number of pixels – great for small prints. However, because of magnification, larger prints have less pixels, and image quality can be affected.
- *Linear CRT* – with the use of a fiber optic coupling or other technology. Features fixed pixel resolution for all sizes up to the limit for the CRT.
- Size of print output – this is variable but typically limited to 12" widths due to the size of the CRT.
- Image quality – good.
- Resolution – can either be variable or fixed.
- Productivity (speed) – moderate to high speed depending on print size, and overall quality of finished print.

LED

The LED printer technology has been the "industry standard" in the portrait industry for years. The printer first came in the market during the late nineties with the KODAK PROFESSIONAL LED 20P (printer and processor) and KODAK PROFESSIONAL LED 20R (roll-to-roll) printers. The design of LED printers by KODAK provided improved depth of field, uniformity, and sharper images from edge-to-edge and corner-to-corner compared to other digital printers.

Designs of LED printers differ by manufacturer. As an example, some feature a "flying single spot " where each LED strikes the same spot. Others are characterized by a light bar of LED's lined across the print (similar to that of large format inkjet head).

The LED printers that are available today continue to provide a complement to the small/medium digital printers, allowing a lab to produce the entire gamut of print sizes required by its customers.

- Size of print output – typically 10" to 50" in width (depending on the manufacturer).

- Image quality – very good to excellent depending on the required output.

- Resolution – approximately 250-300+ ppi.

- Productivity (speed) – moderate (variable, dependent on configuration and software)

Laser

Photographic laser printers were first designed for the commercial market in wide format (32", 50") as a roll-to-roll printer. Laser printers can either be gas or solid state, or both. They are fast and have excellent image quality.

The minilab concept of digital printing was originally designed for the photofinishing market. Digital laser printer designs in a roll-to-roll configuration are now accommodating the needs of high-volume labs.

- Size of print output – depends on manufacturer; typically, photofinishing units use up to 8" while professional finishers use up to 20" (large format units are now up to 72").

- Image quality – excellent

- Resolution – 200-600 ppi.

- Productivity (speed) – varies by print size, considered fast for most applications.

Thermal

There have been major advancements in thermal printer technology in recent years. Today, different thermal printer models can produce from as little as a few prints per hour to as many as 270 with photo quality. In terms of productivity, the high-speed printer option is up to six times faster than other dye sublimation or inkjet printers.

This type of printer may be of benefit for the lab who is planning on "going digital," but does not yet want to make the large investment in a color negative paper digital printer.

Thermal printers, by design, are compact and require no plumbing. Although the print costs are more than what the consumable cost is for printing on color negative paper, the cost per print has been substantially reduced from previous years, and the capital investment is significantly lower than a digital photographic printer. Most thermal printers use cut-sheet paper, while the most productive units use roll paper.

A new thermal printer (KODAK PROFESSIONAL ML-500 Digital Photo Print Station) uses multi-head thermal dye diffusion technology designed to quickly and efficiently produce professional quality photo images. Additionally, the new printers allow users to choose paper surface options (glossy and matte) using KODAK XTRALIFE Ribbons.

KODAK PROFESSIONAL ML-500 Specifications

- Size of print output – up to 8.5" x 37'.

- Image quality – very good to excellent.

- Resolution – 300 dpi.

- Productivity (speed) – 270 8" x 10"/hour (13 seconds per 8" x 10" image).

The Differences Between Printers (Besides The Technology Of The Print Engine)

Once the print engine technology has been selected, other decisions will follow based on how the printer performs. Often, the same print engine technology can generate different image quality results based on the media and software used in the machine. The use of complex "black-box" algorithms for image rendering, color management, paper fill, etc. will play a decisive role in the overall print quality and workflow efficiencies obtained.

In all cases, the printer should be engineered to be "professional lab friendly." (By comparison, some units are designed for photofinishing and marketed to the professional lab market.) The following examples are questions that need to be answered:

- Does the sort tray hold enough images for orders?
- How does the printer handle finished prints of large sizes?
- Can the operator run multiple paper cassettes?
- Do the paper cassette options meet specific lab requirements?
- How easy is it to load consumables (paper and chemicals)?

Printer Configurations
Printer configuration options are essentially either roll-to-roll or roll-to-processor. Not all manufacturers offer both configurations, and not all technologies lend themselves well to both configurations.

The main advantage of a printer in a roll-to-processor configuration is that the print work is complete when it comes out of the processor. Typically, the prints are processed, cut, backprinted, and sorted, in the sequence the orders were input. Providing they meet the lab's quality standards, prints are ready for packaging and shipping.

With a roll-to-roll configuration the main advantage is one of increased burst speed over a roll-to-processor unit that is often limited by the speed of the processor. A roll-to-roll printer also requires a data stream that continues to feed the printer, to obtain its true speed advantage. This requires a computer of sufficient capacity and the need for images to be continuously fed into the printer. Once the printer has made the requested prints, the work will flow the same way as it does in making optical prints. The paper has to be taken off, processed, cut, and sorted by order before it can be packaged and shipped.

Labs must also determine if they want a digital printer with an onboard scanner that is integrated into the printer or an off-line scanner which could be used to feed the printer. Once again, final print requirements and workflow plays a part in the decision making process - is the lab running in a long roll workflow, or strip workflow, and will other products and services be offered from the scan?

Impact That A Printer Has On A Workflow/System
A printer should not only be thought of as a output device (similar to an inkjet printer connected to a PC). The digital printer needs to be fully integrated into the lab's production workflow. In addition, operating software (ie. KODAK PROFESSIONAL DP2) needs to communicate with the printer to achieve the optimal productivity from the system.

Not all labs run the same workflows and may require using different digital printers. And even within a single lab, one type of digital printer may not be sufficient to handle all printing needs. If a majority of the orders is package work (i.e. school finishing), then a large format digital printer may not be recommended. Instead, the lab may be better suited to have a small/medium format printer which will enable the production of a majority of print sizes in the order sequence needed to facilitate post-process packaging/shipping.

Some workflows require a backprint on the finished prints, keep in mind that many large format digital printers do not offer this capability. In addition, if the workflow is one that fulfills orders from all segments (i.e. commercial and portrait/social), or needs to run

display materials (DURATRANS®, etc.) as well as paper, equipment that meets these specialized needs may be limited in other functionalities.

At the same time, the decision-making process for new equipment requires a thorough understanding of the following:

- Changes to the overall workflow (re-education process of how jobs are produced).
- Impact of the changing nature of the customer orders submitted to the lab.
- Changes of how labor hours are used and apportioned.

Other Factors That Affect Print Quality
Image input has a direct relationship to the image output obtained from any output device. The image being printed needs to be correctly sized, in the right color space, and to a large degree matched to the photographer's sales monitor so "expected color" can be obtained.

The need to understand and follow the manufacturer's recommendation for site specifications is important to the success of the printer installation and operation. In many cases, the manufacturer will not even install a printer if the lab has not met the site specifications outlined for the unit in question.

Each individual printer has specific requirements for temperature, humidity, electrical, plumbing, floor stability, network, host computer connections, etc. Once again, working with the manufacturer will ensure that you will be able to meet the recommendations to have a successful installation and obtain optimal results.

Critical Considerations.

Begin by qualifying the company's brand strength, reliability record, and industry integrity.

Some considerations include:

Specifications

- What are the production requirements for speed and quality?
- What kind of output will be produced?
- Is a daylight-load machine or a darkroom-load machine needed?
- What size output is needed?
- What print lengths are needed?
- How does the new piece of equipment work with or compare against existing digital printer(s)?
- How many hours per day will the printer operate?
- Is unattended printing supported?
- What kind of RIP is required?
- What kind of finishing equipment is required?
- What platform does the printer operate on?
- Is the computer up to speed, or does it need to be upgraded or replaced to be able to handle the file/sizes and speed expected from the printer?

Flexibility

- How flexible does the printer need to be?
- Is this printer going to replace or alter my current workflow?
- Does it work with digital production software to increase efficiencies and productivity?
- Are there size, media or space limitations?
- Do the service plan options fit lab requirements?
- Is on-site service available?

Cost

- How much money can be afforded to spend on a new printer?
- What is the base price of the unit and accessories?
- What is the price per print?
- What is the projected annual investment for total cost of ownership (including service agreements)?
- What financing programs are available?
- What's the projected ROI?
- Is training provided, or is it an additional charge?