

Backgrounder

Choosing a Computer-to-plate (CTP) System

How printers can identify the core issues upon which to base their decision and select the system that best meets their needs

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Printers considering the upgrade from film-based plate imaging to CTP are presented with many reasonable-sounding claims that are often contradictory. Ongoing discussion in the trade press suggests that the choice of CTP system begins with a discussion of imaging method, primarily thermal vs. violet (visible) light. As the largest developer and manufacturer of thermal CTP technology, Creo has a clear self-interest in this debate. However, having begun as a manufacturer of visible-light CTP systems and experienced, among its own customers, the original shift from visible-light CTP to the adoption of thermal imaging technology, Creo is in a unique position to shed light on the issues critical to printers wanting to make a fully informed CTP investment.

What may be surprising to many is that the imaging technology is the last point of discussion in the choice of a CTP system. The guiding factor is, in fact, the business impact the anticipated investment is intended to deliver to the printer. Because the implementation of CTP can have positive impacts throughout the printer's entire business, it is important that a decision-maker consider objectives beyond the obvious one of eliminating film from the plate-imaging process. A few examples might include reducing print manufacturing costs, improving output consistency, differentiating presswork offerings, increasing throughput, fostering closer customer relationships, attracting new classes of business, or any combination of these and others. **The decision about which technology to adopt should not begin with an assessment of the imaging technology, but rather with a thorough analysis of what the investment is intended to accomplish.**

So why go CTP?

This simple, pragmatic, question is often neglected in the maelstrom of competing vendor claims. The reasons for printers to consider an investment in CTP are the same today as they have been since plates have been used in the production of presswork:

- a) Eliminate manufacturing redundancy and the associated costs in time and materials, i.e. remove film from the plate-production process

- b) Eliminate variation in the plate-imaging process. Variation in plate-imaging results in longer make-readies and increased time and material waste, compromised presswork-to-proof alignment, an inability to reliably run the finer screens increasingly demanded by today's print buyers, inconsistent pressroom performance, and reworks.

By definition, any type of CTP device will eliminate film. Printers interested solely in reducing redundancy in prepress would appear to have a wide range of CTP technologies to choose from and logically gravitate towards the lowest device-cost offerings. However, that decision only addresses the first criteria and misses the more important business value of reducing variation in the process. Accurately, consistently, and repeatably imaged plates reduce costs, improve pressroom efficiency, and help meet customer expectations in the pressroom, thus increasing profitability. Process control in plate imaging is the key value in moving to CTP; the one that unlocks all the potential benefits and the return on investment (ROI) for the printer. It is the reason why thermal imaging was quickly embraced and adopted by the print industry when it was originally introduced as an alternative to visible-light CTP imaging.

Why is thermal more effective at eliminating plate-imaging variation?

Accuracy, consistency, and repeatability

For the printer, the integrity of the image on plate directly impacts the integrity and profitability of the pressroom. Early CTP adopters realized that plate-imaging accuracy, consistency, and repeatability were key requirements of an effective CTP investment. Thermal imaging earned strong support because it proved to be both stable and consistent, using high levels of power to image onto low-sensitivity plates. The plate coatings respond to exposure by forming an image at a threshold temperature, in a process that is essentially binary: either the image is created or it is not. Over- and under-exposure are virtually nonexistent, and imaging is very consistent.

Comparatively, violet and other visible-light technologies must be used in a light-safe environment, exposing photosensitive chemical coatings with tiny amounts of imaging power (measured in milliwatts). In this situation, even slight variations in power can cause over- or under-exposure of the plate. The quality of the imaged plate can also be affected by minor variations in plate manufacture, storage temperature, humidity, handling, and the development process. If the promise of CTP is to deliver consistency, by their very nature, visible-light CTP systems (including violet) exhibit greater potential for plate-imaging variation. Indeed, plates imaged using visible-light CTP can exhibit inconsistencies similar and even greater than those of a film-based workflow. The cost of that plate-imaging inconsistency shows up in the printer's most expensive asset – the pressroom – in the form of longer-than-necessary make-readies, difficulties aligning presswork to proof, and difficulties delivering consistent repeat jobs.

Versatility, flexibility, adaptability

While all available imaging technologies may do the job of exposing an image on plate, none can claim the flexibility and adaptability of thermal imaging. Thermal technology is used for imaging all three of the major press-based printing processes: offset, flexography, and gravure printing. With thermal plates, prepress

operations can take place in daylight. Consistent thermal imaging also enables the reliable printing of finer halftone screens, which are increasingly demanded by today's critical print buyers. In addition to imaging plates, thermal imaging can also be used to expose proofing media on the same device when there is a need to proof the actual halftone dots. Thermal also drives the vast majority of digital offset presses (including those from Heidelberg, Komori, MAN Roland and KBA). It is also the enabling technology for processless plate-making, which removes yet another imaging variable from the process.

If that's the case, why the new interest in violet-light CTP?

Visible-light systems, including violet-light CTP, have always existed as a competitor to thermal technology. Early CTP devices, which became commercially available around 1994 (including those from Creo), were based on visible-light. Visible-light imaging was, after all, the technology used in the film imagesetters of the day. Violet-laser devices now represent the best of the visible-light systems available. Compared with its earlier non-thermal counterparts, violet technology offers a better, more stable light source to image less-sensitive plates. The reason is that the violet lasers (the key component of the imaging head) are now available as solid-state diodes rather than the volatile gas-driven visible-light lasers that had previously been used in imaging applications. These diodes are also much less costly to produce, making the entire device cheaper to manufacture and thus, easier to purchase.

While both visible-light and thermal technologies will expose plates, thermal retains its edge in plate-imaging integrity and currently remains the only practical way for a printer to reliably differentiate through higher-fidelity presswork (e.g. using high-line AM or stochastic screening) or to adopt processless plates in the future. In a highly competitive market, the combination of cost savings, increased profit potential, and future upgrade capability are the reasons for the continued popularity and growth of thermal technology.

In June 1995—shortly after Creo (in partnership with Kodak) introduced the first truly viable thermal infrared imaging CTP system as an alternative to visible-light systems—the *Seybold Report on Publishing Systems* forecast, "Thermal plate technology appears to offer many attractions to printers...Many experts see the thermal plate as the plate of the future." The market response was immediate and thermal technology quickly out-paced visible light CTP sales. Ten years later, thermal imaging is still the technology of choice, despite the acceptance of some violet-light imaging devices. In its *"Direct-to" Technologies 2004 Report*, Vantage Strategic Marketing points out that sales of thermal platesetters soared to 64% of worldwide sales in 2003—almost two out of every three CTP devices sold were thermal—and thermal CTP plates represented 68% of plate consumption. Vantage Strategic Marketing predicts that thermal technology's head start will continue.

What about the processless plate-making “revolution”?

Anyone following the print industry understands the promise of processless printing plates, especially to smaller printers. Some industry pundits predict the arrival of violet laser-based processless plates in the future—not before 2006, however, and not with current CTP devices. Thermal processless plate-making is available today.

For both violet and thermal infra-red systems, processless imaging requires far more energy than conventional imaging. The power required is in the range of 40 watts, which is within the capabilities of current Creo thermal imaging heads (20-70 watts) but hundreds of times beyond that of current violet lasers (40-60 *milliwatts*). Some analysts predict the emergence of higher-powered violet lasers—undoubtedly with an equally high-priced price tag attached because the price-controls associated with high demand in consumer markets will not apply—but even the most optimistic expectations fall well below the requirements of processless emulsions.

Processless thermal plates are available today. In 2004, Creo introduced two processless plates: a waterless polyester plate for direct imaging presses (Clarus™ WL, available commercially now) and a true processless plate for conventional presses that requires no gumming, processing, or post-imaging treatment (Clarus PL, available commercially in 2005). Printers who have invested in Creo thermal CTP devices will, in many cases, be able to upgrade their devices and switch to processless whenever it makes economic sense for them to do so. Those who invest in violet systems may pay a lower device price today but will face significant capital outlay should they opt to upgrade later.

Calculating the lifespan costs and benefits of a CTP system

The lower initial cost of violet devices makes them attractive in a price-conscious market, and violet CTP devices are heavily marketed to small printers. However, the device cost is only one of the factors to consider when deciding on a CTP solution. Making a wise business decision in an increasingly competitive market is challenging, and should not be based on device-price alone. For printers considering CTP, a Total Cost of Ownership (TCO) calculation can clarify the true long-term costs and advantages of various options, and contribute to an informed purchase decision.

When choosing a CTP system, business owners should consider the purchase in terms of these factors:

1. initial costs (equipment, space considerations, installation)
2. service costs (and how to minimize them)
3. materials costs and savings in prepress and on press
4. disposal costs of chemicals
5. labor savings
6. potential increases in revenue

1) Initial costs

Add the costs for the CTP device(s), the associated software and hardware, the space requirements and environmental preparation. This is only the starting point for a TCO analysis—ongoing costs and savings are far more important. In the initial costs, considerations should include:

CTP Device(s): How reliable is the device, and what is its proven track record? Will a redundant CTP device be required?

Workstations and software: What are the options to drive the CTP device? Is a workstation from the same supplier required, or can any workstation be used, together with a generic interface to drive the device?

Space and architectural costs: How large is the CTP system footprint? Does it require a clean, climate-controlled environment? Will a darkroom or other light-proof handling be required? Will it require processing equipment?

Installation costs including downtime costs: How long will operations be disrupted during installation?

2) Service costs

For any printer, reliability is paramount. To minimize the risk of downtime, it is important to consider the requirements for service and ways to minimize unexpected costs:

Service contract costs: Once the cost of a service contract—over a specified period of time—is added to the cost of the CTP device, the price differential between brands and technologies may diminish.

Warranty coverage: All devices come with a warranty of some kind, but does the warranty cover the most costly parts, or the parts that are most essential to plate-making?

Speed of service: A warranty or service contract is only as good as the speed of service. Can the system be diagnosed and/or serviced remotely?

Equipment design that minimizes downtime: Does the CTP device require frequent calibration? Non-productive time is costly, even when it can be scheduled into off-peak hours: the device must be stopped and someone must perform the calibration. Are critical parts designed for non-stop production? Does servicing require an onsite visit? Creo laser heads feature a redundant design, so that production continues at full speed even if individual lasers fail. A service call can thus be scheduled when convenient for the customer.

3) Materials costs and savings

Many CTP conversions are cost-justified by material savings in prepress and on press:

Material savings in prepress: CTP eliminates all the costs of film and film processing, but CTP plates are slightly more expensive than film-based plates. Note that the cost per plate should include the cost of any required chemistry (irrespective of additional disposal costs). Are film-related savings alone enough to cost-justify a CTP installation?

Disposal costs of prepress chemicals: Except for processless plate-making, all plate-making involves chemicals that must be disposed of in an environmentally sound manner, and disposal costs must be considered. Some violet-light CTP processes rely on silver, a heavy metal that can be very expensive in terms of disposal.

Material savings on press: Paper spoilage is a major cost factor. Will the CTP system under consideration help reduce make-ready time and paper volume used? Are there any ink-savings that can be expected and quantified?

4) Labor savings

Labor costs are a major expense. Creo thermal CTP is a highly-automated process that eliminates film and its associated handling and inspection, as well as the handwork of handling, bending, and processing conventional plates. Can staff be reduced as a result of the CTP installation? Is the system intuitive enough that existing staff be retrained to operate it or would new staff with a specific skill set need to be hired?

5) Potential increased revenue

Prepress and press departments typically don't have the same perspective as the print customer and may not realize the potential customer and sales impact of the CTP investment. Print buyers are driving printers' adoption of FM/stochastic screening to achieve higher-fidelity, more consistent, artifact-free reproduction of their jobs. The finer the screening, however, the greater the demand placed on the integrity of the plate-imaging system. The same process variations that prevented film-based plating from delivering these types of screens in the past still exist with violet CTP systems today. Another reason that printers are adopting FM screening is that it enables the effective use of inkjet contract proofing since there is no longer a need to proof for AM/XM screening artifacts such as moiré.

Making the choice

While the debate over thermal and violet CTP continues, the really important decisions that customers face are about what will yield the greatest ROI when all costs and potential value are factored in. If market acceptance is considered, thermal is still the choice of the great majority of the industry in all print segments, largely because it offers unparalleled accuracy, consistency, overall economy, and ultimate ROI. If the future of the industry, and more importantly the printer's business, is considered, thermal offers the greater adaptability and flexibility, opens the door to processless plate-making, and unlocks the full potential of a CTP investment.

About Creo

Creo Inc. is a global company with key strengths in imaging, software, and digital plate technology. The leading provider of prepress systems, Creo helps over 25,000 customers worldwide adopt digital production methods which reduce costs, increase print quality and allow them to serve their customers more efficiently. Based on a solid foundation of intellectual property, Creo has an unmatched range of technology solutions that address the needs of commercial, publication, on demand, packaging, and newspaper printers, and creative professionals. Creo product lines include software and hardware for computer-to-plate imaging, systems for digital photography, scanning, and proofing, as well as printing plates and proofing media. Creo also supplies on-press imaging technology, components for digital presses, color servers, and high-speed digital printers.

Based in Vancouver, Canada, Creo reported fiscal 2004 revenue of US\$636 million. Creo trades on NASDAQ (CREO) and the TSX (CRE). www.creo.com

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