

# Backgrounder

## Thermal vs. Violet CTP technology

*The debate may rage on, but customers must choose the technology that suits them best*

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Ongoing discussion in the trade press suggests that the question of computer-to-plate (CTP) imaging method, primarily thermal vs. violet light, is still a contentious issue. Printers considering the upgrade to digital plate-imaging processes are presented with many reasonable-sounding claims that are often contradictory.

As the largest developer and manufacturer of thermal CTP technology, Creo has a clear self-interest in this debate. However, Creo continually evaluates the merits of all imaging technologies and remains convinced that, although violet-light technology is certainly a viable alternative for some, thermal CTP technology offers the greatest lifetime return on investment for all sizes of printing operation.

The discussion of CTP imaging technology actually began about 10 years ago, when CTP was first popularized. At that time, the prime motivator to adopting CTP was in reducing manufacturing redundancy (i.e. imaging a plate directly without the use of film), with its associated costs in time and materials. Early CTP devices, which became commercially available around 1994 (including those from Creo), were based on visible-light imaging (a category that includes violet CTP). Visible-light imaging was, after all, the technology used in the film imagesetters of the day. However, in 1995, Creo (in partnership with Kodak) introduced an alternative – the first truly viable thermal infra-red imaging CTP system. The market response was immediate and thermal technology quickly out-paced visible light CTP sales. The greater market share of thermal CTP continues to hold today for some very basic and practical reasons:

### **1. 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. Once introduced, 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 be also be affected by minor variations in plate manufacture, storage temperature, humidity, handling, and the development process.

Regardless of their size or the type of work they do, all printers, depend on plate-imaging accuracy, consistency and repeatability. Their livelihood and business survival depend on it. Eliminating variables is a key component of their print-manufacturing process that makes basic business sense. Consistently imaged plates reduce costs, improve pressroom efficiency, and help meet customer expectations in the pressroom, thus increasing profitability. The promise of CTP is to deliver that consistency, yet by their very nature, visible-light CTP systems (including violet) exhibit greater potential for plate-imaging variation. Ultimately, plates imaged using visible-light CTP can exhibit inconsistencies similar to those of a film-based workflow. The cost of that plate-imaging inconsistency shows up in the pressroom in the form of longer than necessary make-readies or difficulties in aligning presswork to proof in a consistent manner.

## **2. Versatility, flexibility, adaptability**

While all available imaging technologies may indeed 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 (whether AM or FM), which are increasingly demanded by today's critical print buyers. In addition to printing plates, thermal imaging can also be used to expose proofing media where 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) and is the enabling technology for the future of processless plate-making. Almost a decade ago, the Seybold Report on Publishing Systems accurately forecast, "Thermal plate technology appears to offer many attractions to printers... Many experts see the thermal plate as the plate of the future." (June 1995)

Ten years after the battle began, 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 last year—almost two out of every three CTP devices sold were thermal—and thermal CTP plates represented 68% of plate consumption.

### **Why the new interest in violet?**

Visible-light systems have always existed as a competitor to thermal technology. 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.

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: buyers should also carefully review the cost of system maintenance, calibration, chemistry storage and disposal, floor-space requirements, and plates. Making a wise business decision in an increasingly competitive market is challenging, and should not be based on price alone.

While both visible-light and thermal technologies will expose plates, thermal currently remains the only practical way for a printer to 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 growth of thermal technology. In fact, Vantage Strategic Marketing predicts that thermal technology's head start will continue. While violet will see growth, they foresee a maximum market share of 40% by 2008.

## **A revolution underway: processless plate-making**

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-powered price tag attached – but even the most optimistic expectations fall well below the requirements of processless emulsions.

Processless thermal plates are available today from one plate manufacturer, and other manufacturers, including Creo, have demonstrated working processless plates which will be coming on-stream in the near future. 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.

## **Making the choice**

While the debate over thermal and violet CTP continues, customers are faced with making hard decisions about which technology will work best for them in their particular situation. If market acceptance is considered, thermal is still the choice of the great majority of the industry, largely because it offers unparalleled accuracy, consistency, and overall economy. If the future of the industry is considered, thermal offers greater adaptability and flexibility, and opens the door to processless plate-making.

## About Creo

Creo Inc. is a global company with key strengths in imaging and software 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 employs more than 4,200 people and reported fiscal 2003 revenue of US\$578 million. Creo trades on NASDAQ (CREO) and the TSX (CRE). [www.creo.com](http://www.creo.com)

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