

## GATF Answers to the Top 25 CtP Questions

A decision to spend hundreds of thousands of dollars, change a production method that works, and unnerve your employees generates trepidation, and questions-lots of questions. To be specific, it led managers to phone and fax more than 130 questions during GATF's satellite symposium, Mastering Digital Workflow : Breaking the Barriers to Profits in the Computer-to-Plate Age.

Although broadcast time permitted the users panel to answer only a portion of these questions during the two hour videoconference, the questions were saved and analyzed. After grouping similar questions, GATF arrived at a list that provides a clear look at the CtP issues printing companies are struggling with.

Here, then, are GATF's answers to the 26 most frequently asked questions about computer-to-plate, numbered in order of their frequency. The answers are drawn from GATF's experience with operating two platesetters, from user presentations at GATF conferences, from a network of users and manufacturers who reviewed the questions and contributed information.

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### **1. How will I solve the proofing dilemma?**

*Ans :* There are no universal answers to questions concerning digital proofs. Many digital proofing technologies, in a wide array of devices, are currently available, and more digital proofers enter the market almost daily. The solution that is right for you is one that provides adequate quality at a price that won't put you out of business. Proofing options currently used by print shops run the gamut, including

- Dye sublimation proofers
- Color copiers and laser printers (a wide variety),
- Thermal development and transfer technology
- High-resolution inkjet proofers
- High-end devices capable of showing halftone dots.

Each of these devices can and is being used successfully for digital color proofing.

Whatever technology you choose, the crucial step is to build customer confidence in the new technology by showing consistent, high-quality digital proofs. In many cases, the best approach is to make both digital and photomechanical proofs during the transition period. This provides internal verification that the digital proofs are consistent and high-quality while allaying customer concerns that digital proofs are inherently inferior.

The major hurdle for digital proofing's future is the ability to handle a wide variety of true spot colors-colors outside the gamut possible from cyan, magenta, yellow, and black. Since the widespread use of digital proofing in the packaging market depends on finding an acceptable solution to this limitation, manufacturers of dye sublimation, inkjet, and microdot laser proofing devices are all racing to develop true spot-color options.

## 2. What are the capabilities of platesetters now on the market and how easily can they be upgraded to accommodate new plate technology?

*Ans* : Available platesetters can handle a wide range of media, including paper, plastic, and metal plates plus film. Machine sizes range from 2, 4, and 8 to 16 up. Resolutions go from 1,000 to over 4,000 dpi. Platesetters can image screen rulings up to 300 lpi and stochastic screening as well.

The laser imaging head determines which plates a platesetter can image. The lasers most commonly used on platesetters include

- Argon-ion (blue, 488 nm)
- Frequency-doubled YAG (yttrium-aluminum-garnet, 532 nm)
- Infrared laser diode (833 nm)
- YLF (yttrium-lithium-fluoride, 1,053 nm), and
- YAG (non-frequency doubled, 1,064 nm).

Many platesetters can be field-upgraded with different laser heads to take advantage of changing plate technology.

Available RIP platforms include imposition, trapping, server functionality with automatic picture replacement, and stochastic screening. Many vendors offer automatic plate loading. Operators simply load plates into the platesetter, which removes slip sheets, then punches and mounts the plates for exposure.

## 3. What replaces the blueline in my current workflow?

*Ans* : That depends on what you use your blueline for. If your blueline is used internally to check the pagination and positioning of elements on the sheet and to verify that last-minute changes requested by the customer were actually made, then a large-format inkjet plotter should fit the bill nicely. Black and white models are available, but the affordability of color devices means that many printers are creating full color digital imposition proofs. As an added bonus, these devices, which can typically produce images on rolls of paper or acetate up to 36 inches wide, can provide a whole new product for you to sell—full-color posters in short-run quantities!

However, if your current blueline usage includes customer review, you may not want to show them 300-dpi inkjet proofs with relatively low color accuracy. This scenario may call for a larger investment in one of the few digital proofing technologies that allow for large-format, high-quality output.

TABLE I : "COMPUTER-TO" ACRONYMS		
Acronym	Meaning	Explanation
CTF	Computer-to-film	Raster-based imagesetters, both capstan and drum-oriented
CTIF	Computer-to-imposed film	4-up and larger format imagesetters, frequently called imposetters
CtP or C2P	Computer-to-plate	Any kind of plate

CtP	Computer-to-press	Generally short-run, on-demand, electrostatic, or ink-based printers
<p>Computer-to-plate (CtP) refers to the use of a large format laser imager to directly expose aluminum, polyester, or paper plates, without going through a film intermediate. CtP evolved from PostScript imagesetting of entire pages- including text, line art, and halftones (CTF)-to imaging imposed 4-, 8-, 16-, or 32-up flats (CTIF), to direct exposure of plates on the imager. On-demand printing devices, known as computer-to-press (another meaning of CtP) represent another direction of this technology.</p>		

#### **4. What do I do with film supplied by the customer?**

*Ans :* Film can be included in CtP work either by actually incorporating supplied film or by turning existing film into digital files.

To incorporate supplied film into the CtP workflow, you need to use a plate that permits exposure in either a platesetter or a vacuum frame. To incorporate supplied film, you can output fully imposed plates for the rest of the job, then double-burn the supplied pages onto the appropriate plates. Silver halide plates. Thermal plate can be exposed in either a platesetter or a vacuum frame.

To turn existing film into digital files, you need to scan the film using a combination of rescreening and special "copy dot" scanning capability. Copydot scanning of text and line art images produces large files because of the high resolution required. Rescreening to avoid moire can be done on black and white halftone and color separation images.

Ideally, all material for CtP workflow should be supplied in a digital format. Printers who have adopted CtP report that they partner with selected customers to ensure that all information is supplied in digital format and ready to be sent to the platesetter. The advantage to the customer is lower cost and shortened turnaround time.

#### **5. Where will I find platesetter operators and other digital production personnel?**

*Ans :* Conventional platemakers and strippers, or less frequently, press operators, are likely candidates for the "output" department. Knowledge of the production process benefits platesetter operators. Although operating a platesetter is a relatively simple task, operators must understand trapping and imposition and be able to analyze plates to make sure they have been properly imaged and have all the necessary marks.

In some R.R. Donnelley facilities, platesetter operation has been split, with platemakers responsible for imposing and readying files, and press operators responsible for outputting plates at press-side. The press operators quickly adapted to the technology, finding a challenge in the need to maintain the plate processor's chemistry.

#### **6. What plates are available and how well do they work?**

*Ans :* Platesetters cannot image conventional printing plates because their light sources do not match the intensity of the UV lights that image plates in vacuum frames. Platesetters require plates with a special sensitivity. Many platesetter plates look and handle the same as conventional plates. Platesetter plates fall into the following four categories :

#### 1. Silver Diffusion Plates

These plates take advantage of the high light sensitivity of silver halide emulsions. They offer good resolution (up to 300 lpi screen ruling) and high sensitivity, but cost more than conventional plates. Run lengths can be 1,000,000 or more impressions. Due to their high sensitivity, silver halide plates must be handled in red safelight, rather than a yellow safelight or brightlight environment. As far as chemistry disposal, DuPont says the waste stream contains molecular silver, which is filtered off, leaving less than 1 ppm silver in the waste stream.

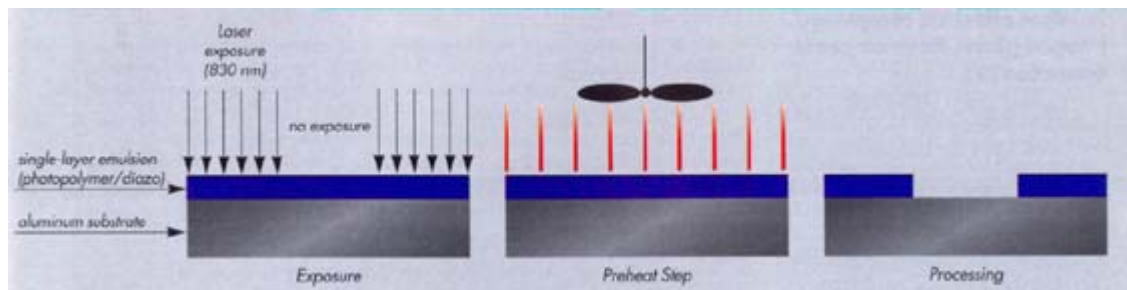
#### 2. Photopolymer Plates

These plates take advantage of special, high-sensitivity, light-sensitive plastic (photopolymer) emulsions. They offer the same look and feel as conventional plates and are processed in water-based chemistry. Run lengths are about 350,000 impressions without backing, longer with backing. Resolution is limited to about 175 lpi screen ruling by an "oxygen barrier," a polyvinyl alcohol coating that tops the photopolymer to extend shelf life. Due to the high sensitivity of the photopolymer emulsion (required for laser exposure), the plates may vary in sensitivity from batch to batch and have poor latent image stability, producing inconsistent results. Plates must be processed soon after exposure and require red safelight conditions.

#### 3. Hybrid Plates

Hybrid platesetter plates were developed for long run lengths (up to 1,000,000 impressions). They use a combination of conventional photopolymer emulsion (for run length) and silver halide (for sensitivity). They have the same look and feel as conventional plates, are available for a wide variety of lasers, and can be exposed conventionally or digitally. Hybrid technology, however, uses a double exposure, which can reduce resolution. The process also requires a large processor with two waste streams. Hybrid plates need red safelight handling.

#### 4. Thermal plates



*Figure 1. : This diagram shows the mechanism of the Kodak Direct-Image Thermal Plate, which consists of a single-layer photopolymer/diazo emulsion. Exposure to an infrared laser diode (830 nm) initiates polymerization of the emulsion, forming a latent image. Processing begins with a preheat step that completes the cross-linking of the polymerized emulsion. In the second step, the plate is exposed to an alkaline developer, similar to that used on conventional positive plates, that removes the unpolymerized emulsion in non-image areas.*

The thermal imaging mechanism (see, for example, Figure 1) provides excellent image sharpness and exposure latitude so that it is difficult to over- or under-expose these plates. Their high resolution makes them well suited to imaging stochastic screening. On the other hand, their current limited availability, higher cost, and the need for a thermal laser head in the platesetter can be counted as disadvantages. A platesetter can no longer image film after it is converted to thermal imaging.

## **7. What effect do computer-imaged plates have on press operation?**

*Ans :* It has become accepted that computer-imaged plates reduce makeready time and waste because they are imaged in better registration. Also, because these plates have a sharper dot, the tonal range is expanded, perhaps helping the press operator come up to color more quickly. The extent of these makeready savings remains unclear. In almost all other ways, manufacturers have succeeded in developing CtP plates that perform on press the same way as conventional plates. Digital Plate Control Targets available from GATF, can help press operators judge whether plates have been properly imaged.

In theory, except for the digital proof that arrives with the job, the use of computer-imaged plates should be invisible to press operators. In reality, press operators are likely to attribute to digital plate problems that are, in fact, shortcomings of the digital workflow.

For example, depending on the digital proofing method, trapping or imposition errors may not be detected until the job is on press. Color matching problems may also surface if the proofing device cannot be matched to the press with color management software. Press operators will need to gain confidence using digital (frequently dotless) proofs. Gaining the client's confidence will probably require more press OKs for a while.

Many of these problems will be minimized over time, but for now, to avoid developing a negative attitude, press operators need to be educated about the change and the long-term benefits to the pressroom (e.g., fewer plate remakes and quicker makeready).

## **8. How do I implement CtP, and where do the biggest problems lie?**

*Ans :* The GATF satellite symposium outlined a 12-step hybrid solution for the CtP transition. The major thrust of the transition plan is that no one should try CtP until they have a smooth-running, efficient electronic prepress department. Before taking the CtP leap, make sure your prepress department is proficient at outputting

imposed pages to film. CtP will not cure a 40% plate remake average! This technology enhances quality and productivity, but only if the proper steps are taken to prepare for this new technology.

### **9. What will happen to my plate remake levels?**

*Ans :* One of the tenets of a CtP workflow is that it improves quality. The physical effects and errors-halation from dirty, dusty vacuum frames, poor drawdown-introduced during conventional platemaking are eliminated. If these are your most common causes of plate remakes, eliminating them significantly reduces remakes. Some users have experienced an overall drop in remakes by 50-75%. The potential for improperly developed plates still exists with laser-imaged plates, but this is rare, and companies selling thermal technology promise to eliminate processing inaccuracies.

The relative immaturity of CtP Technology (Please note : This white paper was compiled in 1996), characterized by small manufacturing runs of plates and ongoing experimentation with plate coatings, did create remake problems for early users. Pinholes in the imaged area have been a common complaint. These problems appear to be dissipating as plate manufacturers gain more experience and standardize their manufacturing processes.

Printers have to develop a CtP workflow in which the speed of plate remakes is at least as fast as using film to re-image a plate. Short-term storage of the RIPped data is the key. Systems that simultaneously RIP and image use digitally imposed page files to remake plates. With these systems, high-quality color pages may take longer to image since today's RIPs are not fast enough to keep up with platesetters for this type of work. Remaking a damaged plate can take 3 to 10 minutes depending on the resolution, plate size, and whether you abort a plate currently being imaged in order to rerun the damaged plate. This is sufficiently fast compared with conventional platemaking on a vacuum frame or step-and-repeat machine. Most plate imagers don't stand around waiting for plate remakes, and so they expend time finding the proper film. A plate remake on step-and-repeat equipment can take as long as 30 minutes.

### **10. How important is it to use the same RIP for imaging the proof and plate?**

*Ans :* Many potential buyers of digital proofing devices express great concern about possible problems that might occur when one RIP interprets PostScript data for the proofing device, and another RIP interprets files for the platesetter. This has led many consumers to seek solutions in which a single RIP can drive both the digital proofer and the platesetter (or at least to purchase identical RIPs, which are then dedicated to each device).

However, while the potential for two dissimilar RIPs to interpret PostScript data differently cannot be ignored, the number of successful CtP installations without a consistent RIP architecture for proofing and platemaking suggests that these concerns are often exaggerated. In fact, even a prepress department where one RIP drives both the proofing device and the platemaking device is somewhat prone to errors if the PostScript data must be sent to the RIP twice (once at a low resolution for the digital proofer, and again at a higher resolution for the platesetter). This concern is addressed by RIP manufacturers who allow the RIPs as option of interpreting high-resolution PostScript data into a raster image, and then resampling

that raster for the lower resolution required by most digital proofers.

### **11. Does CtP technology lend itself to stochastic screening?**

*Ans :* The inherently high resolution of direct plate exposure lends itself well to stochastic, or frequency-modulated (FM), screening. This type of screening uses high-resolution spots that are the same size but create the illusion of varying tone through variable spacing, or frequency.

One problem with stochastic screening has been difficulty in imaging the small spot size on proofs and on plates. High-resolution plates, particularly the silver halide and thermal plates, can successfully image stochastic screens. The fact that conventional, film-based proofs are difficult to image accurately with stochastically imaged film may provide an impetus for customers to accept digital proofs.

Through the use of color calibration and management software, digital proofs can be set up to simulate the appearance of stochastically screened images even though they do not use halftone dots. For jobs with stochastic screening, digital proofs may be more accurate than conventional proofs.

### **12. What utilization rate is necessary to make CtP profitable for me?**

*Ans :* It is difficult to set a universal utilization rate that will define CtP profitability because of the variables from installation to installation, including annual sales, type of work, total plates exposed, condition of files from the customer, types of plates used, and type of CtP device being considered.

Presstek says it has customers who have realized a 17-month payback based on 20 plates per day. Misomex states that they have seen payback in less than 2 years based on less than 50% utilization. Platesetter vendors use a variety of financial models to help customers develop detailed ROI analyses, using spreadsheets that can be customized for various scenarios.

The price for purchasing different CtP systems varies. In addition total would be costs for network enhancements, additional storage space for electronic files, additional staffing, a large-format ink jet proofer, a two-page digital proofer, and potentially higher costs for plates.

### **13. How is color management being used in a digital workflow?**

*Ans :* Color management involves profiling the four basic components of CtP workflow and using software to automatically correct for color reproduction ("matching"). The four components are scanners, monitors, proofers, and presses.

Color management software uses an industry-standard target, called the IT8.7, to determine the color reproduction characteristics of a scanner. An operator scans the IT8.7 target, and the software determines the color transformation needed to get the scanned IT8.7 color patches to match the values of the IT8.7 supplied in a companion file.

To calibrate and characterize a monitor, several suction-cup based radiometers can be used.

To characterize a proofer or printing process, software programs use proprietary color targets containing anywhere from 80 to 712 patches. For example, ICC program includes a 212-patch target that can be measured with a handheld spectrophotometer.

Color management software converts RGB scanner files to CMYK printer files, taking into account the profiles of the scanner, monitor, proofer, and printer.

#### **14. How will CtP technology change the relationship of prepress firms and printers?**

*Ans :* The move to an all digital workflow is resulting in more of the prepress work being done by printers, making it difficult for traditional separators to sustain past levels of business.

Obviously, prepress firms will increasingly provide their customers with electronic files, separated and ready to be imaged on a printer's platesetter. It is not likely that many prepress firms will install platesetters. A much more popular decision will be for firms (including service bureaus) to add short-run digital printing to their list of services. And, as indicated in GATFWorld's series of articles, digital photography is providing new turf for some firms.

#### **15. What will allow CtP, computer-to-press, and toner-based on-demand printing technologies to coexist?**

*Ans :* Four differentiating factors come into play with these printing options : cycle time, run length, variable printing, and cost. First, however, let's define our terms. Let's define CtP as 4-up or 8-up platesetters. The computer-to-press (what some people call the CtP-on-press) option includes the Heidelberg GTO-DI and Quickmaster as well as the Omni-Adast. The ondemand category includes the Indigo and various flavors of the Xeikon technology.

For certain market segments, time is money more than money is money. For these markets electrophotographic or toner-based on-demand printing offers significant advantages. It is possible to place an order with a facility using an on-demand press at 9 a.m. and walk out by lunchtime with 50 or 350 impressions.

One of the main advantages of CtP is faster turnaround or reduced cycle time. With CtP technology a customer could place an order at 4 p.m. and have printing delivered by 9 a.m. the next day. An additional advantage of CtP is that print quality is higher than toner based printing.

When on-demand presses were first introduced, run lengths were estimated to be between 35 and 3,500 impressions. Newer technology has challenged both ends of the market. On the high end are the CtP-on-press options and plate and press enhancements such as automatic plate mounting. On the other end of the market are the faster color copiers.

One of the strongest selling points of on-demand printers is their ability to use variable information to produce variable printing.

#### **16. How applicable is CtP to different market segments newspapers, packaging, catalogs/magazines, books, directories, advertising, etc.?**

*Ans* : Book and financial were the initial buyers of large-format platesetters, using them for single- and limited-color work. Magazine and catalog printers are now installing the technology as managers become more confident of their ability to handle color pages.

Depending on the market, printing companies have primarily marketed CtP technology on its ability to speed turnaround (i.e., financial printing clients can have one more day to update financial prospectuses and still ensure proper timing) or on its ability to save the client money (i.e., book publishers can trim expenses, particularly on short-run work). Understanding client motivation is essential-the shorter the cycle time, the more likely that saving a day in production is considered a tremendous advantage.

CtP's newness and high equipment costs restricted its early use to large printers who were working closely with long-standing clients and with the resources to perform research. Printers who are serving color printing clients primarily motivated by cost savings will probably be among the last to install the technology, waiting until the per job cost savings from going filmless is well-documented and the cost of CtP systems has come down. Printers pushing cost savings need to be cautious since there are significant investments associated with a filmless workflow that require payback in an acceptable time frame.

### **17. How will I handle and archive the huge files needed to drive platesetters?**

*Ans* : Files can be archived for shortterm (a few days, back-up) or longterm (archival) purposes in different formats and with different solutions. One strategy is to save RIPPed files. The files can be saved on the platesetter's hard disk until the printed piece is finished. Typically, a short-term strategy like this is used when a plate wears or is damaged. The advantage is that the plate can be re-imaged quickly.

A few companies use this as a longer term strategy if they have products which don't change. For example, some book and reprint printers save RIPPed files on inexpensive DAT tape with the Krause system. The disadvantage with saving RIPPed files is that they are huge and uneditable. On the other hand, this strategy is untenable for applications that become obsolete quickly or that require frequent updates such as on-demand products. In these situations, some people save both the multi-page application file and the single-page PostScript file. The advantage in this case is that a few pages can be changed and then converted into PostScript files which are then merged with the "unchanging" PostScript pages during imposition for a shorter manufacturing time. Again, the disadvantage is file size. The most obvious strategy is to save application files (e.g., Quark- XPress, Illustrator, etc).

Storage options include CD-ROM, magneto-optical drives, DAT tape, and removable media.

### **18. How should files be prepared to optimize digital production?**

*Ans* : The adoption of CtP means creating fully digital documents and carrying those documents through an organized, consistent workflow. Perhaps the best thing about CtP, though, is that this workflow introduces no new requirements for preparing

digital files. Instead, it mandates utilizing all existing electronic publishing principles and techniques to their fullest extent. For example, without film there is no stripper, no light table, and no photomechanical proof. This means doing all your trapping and imposition digitally.

Close scrutiny of digital data, however, is no longer just a good idea-it is essential! File preparation, especially of color pages, needs to be impeccable and precise. Preflighting is essential for catching problems before you get to platesetting.

### **19. What options do I have for trapping and imposing files?**

*Ans :* Trapping and imposition will need to be done digitally. Trapping-the creation of color overlaps ("spreads" and "chokes")-to compensate for misregister on press, needs to be checked during preflighting. You can choose to disable all customer-supplied trapping and perform your own to guarantee the results. Several off-the-shelf software programs are available for trapping on the Macintosh platform. They can be used with all the platesetters and imagesetters on the market.

Faster trapping can be done by RIP-based trapping software, which traps files on-the-fly while RIPPING.

### **20. How does file compression affect the digital production process?**

*Ans :* File compression reduces the size of files, which is important when transmitting files over phone lines or through networks. File compression makes the process quicker.

Compression is either "lossy" (information is discarded so a file becomes smaller) or "lossless" (no information is lost and less compression occurs). As Phil Green explains in *Understanding Digital Color*, (GATF 1995), "Lossless algorithms search for similarities within the captured data that they can code more efficiently. Lossy algorithms discard data that is least perceptible to the eye." With lossy compression there is a direct relationship between the amount of compression, the amount of information discarded, and the file size. Different compression levels can be selected starting with a minimum 8:1 compression ratio.

The most popular lossy compression method used in the graphic arts is JPEG (Joint Photographic Experts Group). JPEG is commonly used on EPS and PICT file formats.

The most popular lossless file compression method is LZW (after its authors, Lempel, Ziv, and Welch). This type of compression is most popular with word processing text and can reduce a file by 50%. It can also be applied to bitmapped images (such as TIFF files) but with significantly less compression than JPEG.

JPEG compression reduces network transmission time but could also result in lower quality, depending on the compression ratio. LZW compression, on the other hand, doesn't jeopardize image quality but does result in less compression and longer times for operations with halftones.

### **21. What effect will Adobe's portable document format software have on my digital workflow?**

*Ans :* One of the issues in using CtP in publishing is that advertisers and their

prepress suppliers generally send film because different high-end systems use different native file formats. The use of film adds extra steps (dot-for-dot scanning) and decreases the advantages of CtP (fewer steps, faster turnaround). Some users have suggested that the Acrobat PDF (portable document file) format would be a good cross-platform standard and a universal file format that advertisers could use to transport these ad files to the printer. Adobe Acrobat software, previously code-named Acrobat Amber, creates portable document format (PDF) files. On one hand it is directed at Web publishing; on the other hand it has been redirected toward high-end print production.

Adobe has also created a plug-in to view PDF pages within Web-browser software. This plug-in allows you to work with files on the Internet or within an Intranet. Some of the advantages of Amber on the Web are that it downloads only the data necessary to display any given page (as opposed to all pages) and it will render text first, then download graphics, in background mode. Therefore, one direction of Acrobat is Internet or Intranet Web publishing.

At the same time there are significant additions to the PDF file format for high-end print production applications. Among these capabilities are support for all PostScript Level 2 color models, including named color spaces (and spot colors), overprinting, screens, patterns, fills, and Open Prepress Interface (OPI) comments.

Perhaps most important, the new Amber format supports, for the first time, CMYK files. The current version of Acrobat supports only RGB color files and therefore cannot make color separations. Some experts say that Amber may represent the next version of PostScript or possibly PostScript Level 3.

## **22. How much does CtP technology cost?**

*Ans :* According to a list developed by Frank Romano, Melbert B. Cary Jr. Professor at Rochester Institute of Technology, platesetters cost anywhere from \$95,000 (4-page format) to over \$771,000 for the Krause Laserstar 170C (53x67 in. or 16-page format). Prices vary widely with the size and features of the platesetter. Sizes include 2-, 4-, 8-, 16-, and 32-up machines. RIP platforms include imposition, trapping, automatic picture replacement, and FM screening. Many vendors offer automatic plate loading; operators simply load plates into the platesetter, which removes slip sheets, then punches and mounts plates for exposure.

In addition to the cost of the platesetter, there is also the cost of other elements required for digital production, including digital color proofing, digital blueline plotting, telecommunications, scanners, and workstations and software for electronic production.

## **23. Who owns the files used to drive the platesetter?**

*Ans :* This needs to be part of the client agreement. Many printers want to retain ownership of files that contain value-added services, such as trapping, imposition, preflighting, and repairs to customer-supplied files. Since the files require less manipulation, profit is generally greater on reprint jobs. Printers are concerned that if they give these files back to the customer, a competitor will reap the benefit. If a customer has paid for added services, such as color correction, image retouching, and file repair, then that customer would probably claim ownership of the files.

Obviously, the editorial and advertising content of the job, as well as the files supplied to the printer, remain the property of the client.

#### **24. What are the environmental benefits of moving to CtP?**

*Ans :* The printing industry's impact on our air, water, and soil is under closer scrutiny than ever. Regulations control the amount of silver that can be discharged by prepress departments into a community's sewage system, and the off-site disposal of spent chemicals and materials from film processing is increasingly expensive. CtP reduces the environmental impact of digital prepress production both directly and indirectly. It eliminates film from the production process, and also eliminates the chemistry and packaging associated with raw film and its production. The increase in productivity and efficiency brought by CtP indirectly benefits energy consumption by reducing the energy used because of light tables, film processors, and conventional plate and contact frames. The future of CtP promises even more environmental benefits as the industry begins to utilize thermal plates-which require little or no chemistry for processing.

#### **25. How do I encourage my customers to use a completely digital workflow?**

*Ans :* Each customer has unique goals and performance criteria, be they cost, turnaround time, quality, or something else. If you know which criteria are most important, then you can suggest production options that will help them meet their goals. For example, if you learn that fast turnaround is most important to one customer, you can offer faster turnaround services if they provide you with 100% digital files. Of course the only way to produce a job faster is if you have the technology, such as CtP equipment or digital presses, that takes advantage of the digital files. Presstek points out that a publisher who cannot supply 100% digital files may be behind in the conversion to electronic production. They suggest offering to regenerate the customer's work within your company for a reduced fee, or working with a local design firm to accomplish the same goal. The customer will be able to update their work at the same time.

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