Summary of Laser Technology - Violet vs. Thermal

Violet and thermal are the dominant technologies currently in use in platesetting. There is much debate in the industry about the merits and flaws of each technology. We have discussed both technologies throughout the preceding sections of this paper, but have not directly addressed the frequent question of "which is better - violet or thermal". Of course, this question is impossible to answer. The real question is not which is better, but which is better for each company's particular needs, budget, and future. The answer to this depends on what are the main concerns of each company in acquiring a CTP system. These possible concerns include *quality, initial investment, safelight requirements, throughput, run-length, consumables cost and availability, environmental impact, and maintenance requirements*. Therefore, we are not going to say one technology is better than the other, but rather provide information on the pros and cons of each technology for each of these issues.

Quality: The main argument against violet is that output quality is subpar compared with thermal systems. However, this is not the case in all situations. It is true that thermal plates are capable of producing ultra-high quality with line screens exceeding 300 lpi, which violet plates cannot do. But this is not a requirement for the vast majority of users. For the vast majority of applications, silver-based plates imaged by violet lasers produce output comparable in quality to output from thermal platesetters. The other choice for violet is the photopolymer-based plate. Although historically, photopolymer plates have been judged to be inferior to silver and thermal from a quality perspective, recent advances in photopolymer technology has made available improved quality that meets or exceeds the requirement of commercial printers requiring a superior quality product.

Initial Investment: In general, violet platesetting equipment is less expensive to purchase than thermal equipment.

Safelight Requirements: Violet plates are light sensitive, and hence require handling in safelight conditions, however autoload options available on many machines can minimize this requirement. Violet plates have an advantage over previous visible laser technologies in that they can be used with yellow safelights instead of the red lights required by green sensitive plates. Thermal plates have a further advantage over violet in that they are not light sensitive and hence do not require safelighting. They can be handled in daylight conditions with no adverse effects.

Throughput: Violet is generally faster, and particularly so where only low resolution is required, as output speed on an internal drum device is directly proportional to the resolution setting. The lower the resolution that is required, the faster the machine will image. However, new technologies in the thermal drum arena, such as laser power, expanded quantity of diodes, and GLV technology, are providing considerable improvement in the throughput of thermal platesetters.

Run-Length: Thermal plates offer the longest run lengths possible, but to achieve this, they must be baked. Unbaked run lengths for thermal plates varies among the many products available on the market, from 150,000 to 400,000. When baked, thermal plates can produce up to 1 to 2 million impressions, depending on the plate type. Processless thermal plates offer run lengths of 100,000 impressions. Silver-based plates are capable of producing in the range of 350,000 impressions. Photopolymer plate run length varies among manufacturers, from 200,000 to 400,000. These plates can also be baked to yield up to 1 million impressions.

Consumables Cost and Availability: Considering the many competing consumables manufacturers, and the many factors that are involved in the manufacturers pricing that each customer receives, consumables cost is impossible for us to quantify. The type of plate and chemistry required is just one factor. Other factors are the volume of plates being purchased, presenting negotiating opportunities for the purchaser, whether any additional equipment is being purchased that would allow the manufacturer to offer a "consumables deal", etc. We recommend that each buyer check with their suppliers for pricing as it applies to their particular situation. One concern that buyers should keep in mind is the number of manufacturers for each plate type. To our knowledge, only Agfa (Lithostar) and Heidelberg (Saphira) manufacture silver-based plates. There is a wider variety of photopolymer plates available, including those from Agfa (N91), Fuji (Brillia), Konica (Duros), Kodak (VioletPrint), and Escher Grad (EG-HRV1). Except Escher Grad, all these

manufacturers produce at least one thermal plate, while some (Agfa, Kodak and Fuji) have half a dozen varieties of thermal plates available. In addition to the major manufacturers, there are a variety of other producers (such as Southern Lithoplate) of thermal plates as well. Clearly, consumers have far more choices among thermal plates, including processless plates, than plates for violet lasers.

Environmental Impact: Silver-based violet plates have the worst impact for the environment. Silver is a pollutant, and must be removed from waste chemistry before its disposal. Photopolymer plates do not have this issue, but they do require chemical processing. Thermal plates are silver-free, but most require chemical processing. However, there are also processless thermal plates available which eliminate the need for chemicals entirely, thereby providing the least environmental impact. Currently processless plates are not available for violet platesetters. At Ipex 2006, Agfa previewed their violet processless plate prototype, but they are still not available on the market. Furthermore, this plate will probably require a minimum of a 30 mW laser in order to image.

At Drupa 2008, both Agfa and Fuji introduced a violet processless plate. Agfa, it appears, is restricting their plate to the newspaper industry initially. The availability of information at Drupa was limited, indicating their offering will not be available immediately. Fuji, however, distributed a brochure with full disclosure of the specifications inherent in their product. It appears that Fuji's ProV plate will be available in the waning months of 2008.

Maintenance Requirements: It appears that maintenance cost for violet-based platesetters will be considerably lower than thermal over the life of the equipment. In violet equipment, there is one laser diode to replace. In thermal machines, there are multiple diodes that may at some point require replacement, or in some cases, multiple diodes that cannot be replaced individually as they are contained in a single very expensive head. Not only are lasers less expensive to replace, they are longer lived in violet machines. Furthermore, another cost associated with thermal is the maintenance of the plate clamps and registration punch required for external drum thermal devices, which are not used on the internal drum violet platesetters. On the Screen PT-Rs, for example, it is recommended that the plate clamps be replaced every 30,000 plate loading cycles (depending on model), at $2,700 for the clamps, plus the cost of the service call. The registration punch requires maintenance every 10,000 plate cycles. These punches do not necessarily have to be replaced at every 10,000 plates. Rather, they need to be removed, cleaned, oiled, and inspected for damage. If replacement punches are required, the price is in the range of $5,000 to $6,000 plus the cost of the service call. Internal drum technology does require a high-speed spinner motor that can fail, but this failure rate is impossible to quantify and may not occur under normal operating conditions.

Violet silver-based plates do have one issue that purchasers should keep in mind. There is considerable debris from these plates that is removed during processing, leading to an accumulation of a purple "sludge" in the processor. This sludge stains easily and requires attention on a weekly basis. With silver-based plate, users will run into more processor maintenance by the operator than with other technologies.

Summary

Clearly there are pros and cons for each technology. Thermal technology offers the user quality output, user-friendliness, long run lengths, and a wide variety of plate choices, all with minimized environmental impact. The downside of thermal is the high acquisition cost and high maintenance cost, and less speed versus similarly priced violet devices. Violet users benefit from this technology's lower acquisition and maintenance cost, and high throughput. Unfortunately, violet does not offer the same range of plate choices, including no currently available processless plates. Violet users also have to make the choice between higher quality silver plates which have significant environmental impact, or photopolymer plates that do not contain silver but will require a special processor with preheat capability. The question you must answer, is the considerably reduced cost involved with violet technology worth it, given the quality, environmental, and plate choices that must be made? Can the extra acquisition and maintenance cost of a thermal platesetter be justified? It is up to each buyer to decide. The pros and cons will have to be weighed by each individual buyer to decide which technology is the right choice for their situation.