BY ANDERSON VREELAND

This year's IMDA conference, "Innovation and Technology; Keeping Us Competitive", made me recognize what others in our two-piece industry feel is lacking; that being *some type of standardization* - which is critical for the shared understanding of new technologies and processes.

I would like to address one facet of this issue by identifying terminology and processes used to make printing plates. Our industry has seen substantial changes over the past five-to-seven years. The terms that I use may not be the same as terms used by the can industry, but they are terms used throughout the printing and graphic arts industry.

Analog

The analog process has been used since the introduction of photopolymer printing plates. What is photopolymer? Photopolymer is a plastic, light-sensitive material used as a printing plate. To create an image on the plate, a material is required that will let light through in certain areas while blocking light in other areas. A film negative that is black and clear is used for this purpose. The clear area lets light pass through while black areas of the film block the light, preventing exposure to the photopolymer. Areas of the photopolymer plate exposed to light are cross-linked, creating an image on the plate. Unexposed areas of the plate that do not receive light are not cross-linked.

What is cross-linking? Photopolymer plates use an ultra-violet (UV) light inhibitor that reacts to a certain wavelength of light. A cross-link is a bond that links one polymer to another after exposure to UV light. Cross-linked photopolymers create the image on the plate.

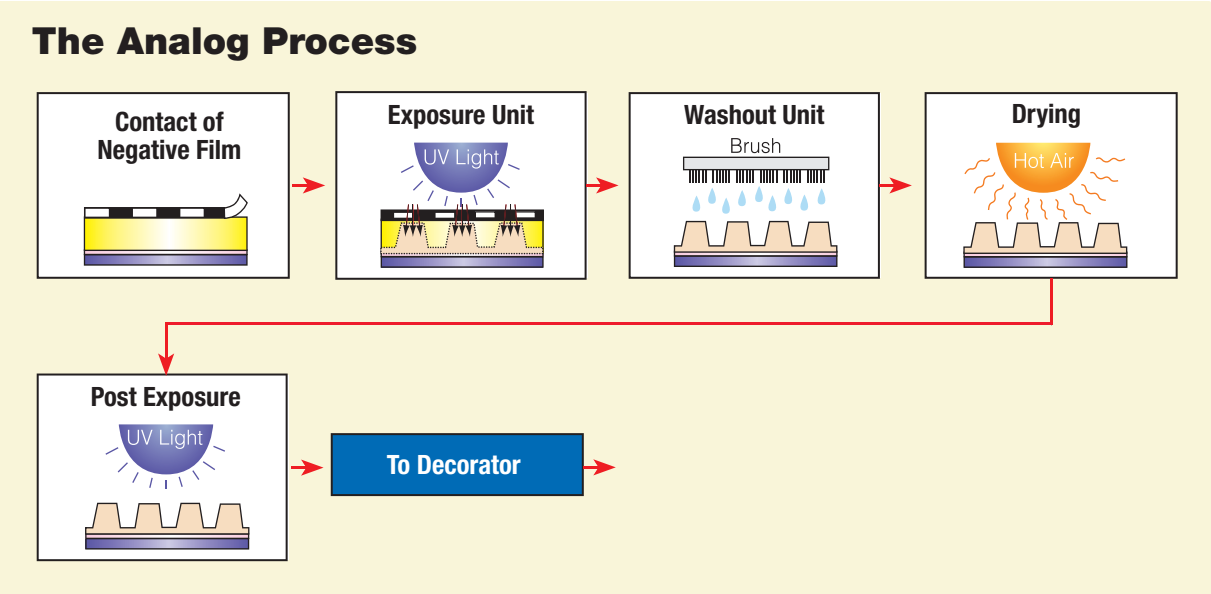
After the exposure process, the plate is placed in a washout unit that removes the unexposed photopolymer by a washout process creating a two-dimension image on the plate. The next step is drying. The purpose of drying is to remove any moisture and swelling of the plate that occurs from the washout process. Swelling is minimal with water washout so the time required for drying is very short.

The final stage in analog plate processing is post exposure. This may be the most important stage in analog plate processing, second only to exposing the plate with a negative. The plate is placed in an exposure unit (without a film negative) and exposed to UV light. This process makes sure all of the polymer has been cross-linked and hardened. The plate's hardness or durometer, serves to protect the plate from harsh chemicals that may be used during production or post production (cleaning).

The analog process has been used since the introduction of photopolymer plates and in some cases is still utilized today in the two-piece industry.

Advantages: This is a well-known process in the industry. Several options of photopolymer are available from manufacturers.

Disadvantages: Obtaining parts for film processing is becoming more difficult. There are only two film suppliers in the world and costs keep increasing. Plate quality is good using the analog process, but not as good as other options. Plate quality is also determined by the experience of the person making the plates.



CTP

Due to some issues using the analog process, mainly the film, a need arose for an alternative plate processing method. This is where CTP comes in. What is CTP? CTP stands for Computer-to-Plate. This is a standard term used in the printing industry and should be used in the two-piece industry.

We currently use terms like DLX (SPGPrints) and CDI (Esko), and numerous brand names of products made by other manufacturers. While these companies love that we use their brand names, our industry would be better served referencing the process (CTP) rather than the manufacturers.

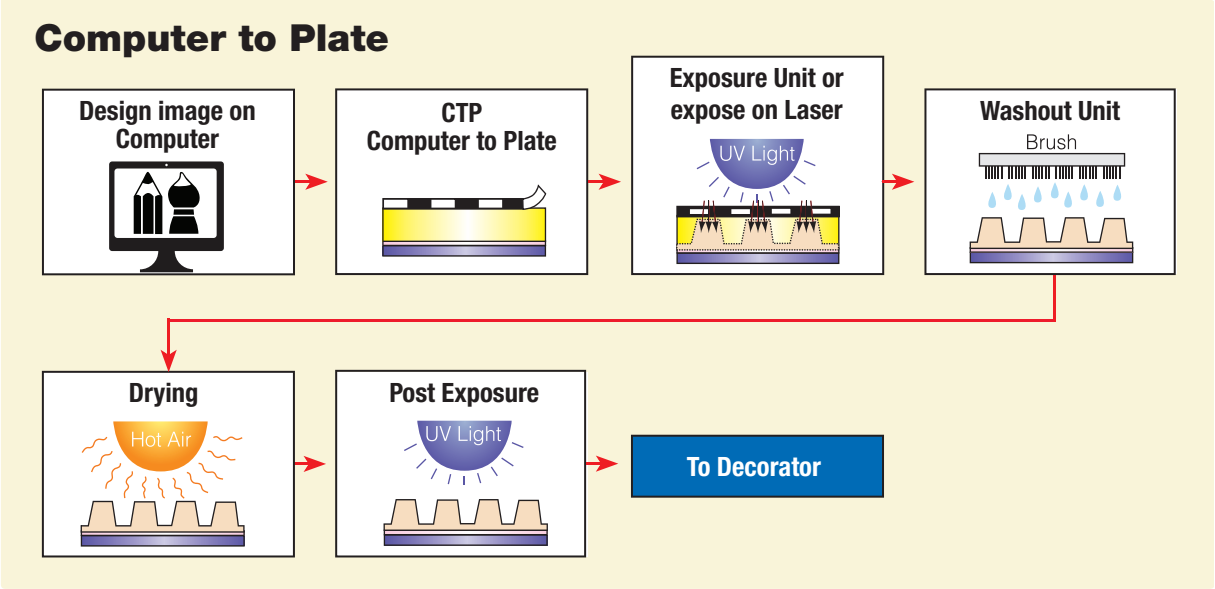
So, what is the CTP process? The CTP process eliminates the film negative used in the analog process and uses a plate with a carbon mask layer (the negative replacement). Just like the analog process that uses film, we need to create a clear area where light passes through, while black, opaque areas block the light.

A low wattage laser is used to remove areas of the carbon mask creating clear areas that let UV light through to expose the photopolymer plate. There are different types of lasers that can be used. For simplicity's sake, a low wattage laser is used for this process. The computer translates the plate image to "laser language", a process that separates the colors to make separate plates (just like film). To create an image on the plate, the laser will either be "on" or "off". When "on", the laser removes the black carbon layer. The carbon layer remains in position when the laser is off. When completed, the plate looks just like a negative, only the negative image is actually on the plate.

Now that the plate has been imaged, it requires exposure to UV light and the other steps described in the analog process. The black carbon layer imaged on to the plate will be removed in the washout process resulting in a two-dimension plate.

Advantages: This process offers better print quality over the analog process and is more user friendly. The CTP process can reproduce finer screens. For the most part, you can use the same plate manufacture that you used processing analog plates.

Disadvantages: Cost of plates is higher and the carbon mask in the washout can be dirty.



DLE

Last but not least is DLE – Direct Laser Engraving. This is the process that is changing the entire two-piece industry with impressive quality experienced today – and what will be done in the future.

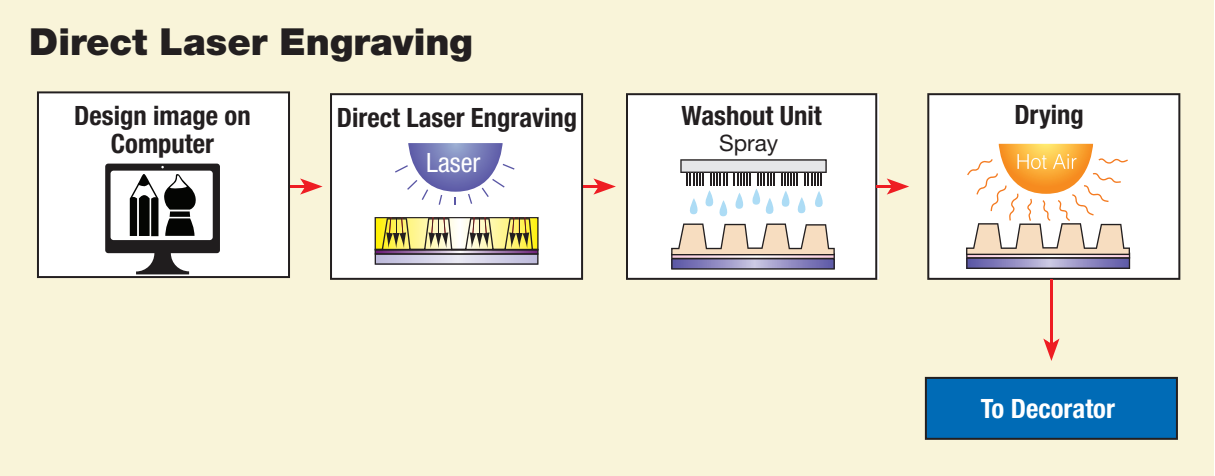
What is DLE? Direct laser engraving places an image directly on to the plate. There is no negative, no carbon mask, only the plate itself. Just like with CTP processing, a computer is used to separate colors and make separate plates with separate images.

What makes DLE different than other processes? DLE create a 3-dimension image on the plate that allows better control of just about everything, including the height of the image. The image is transferred on to the plate by removing the non-image areas with a laser. Depending on the application, the plate is then removed from the laser and placed in a cleaning machine.

Materials that can be used for plates include traditional photopolymer that you need to cure. One note - not all photopolymers will work. Other materials that will work are polymer with no uv curing and elastomers like a black rubber formula. The type of laser technology used in DLE will determine the specific type of plates you can use. CO2 lasers, the most popular lasers used today, can process a range of plates, including polymer and elastomer in different colors.

Advantages: DLE offers far superior print quality, possibly the best, especially with screens. You can process different types of plates, depending on the laser. The 3 dimensional imaging allows much greater control of printing parameters. DLE is very user friendly.

Disadvantage: Compared to CTP and Analog, the DLE process in slower. Cost of the equipment can be higher.



We now know the processes that are available. What is next?

As the saying goes, Noah did not build the ark in a day. Establishing standards for our industry will also require some time. Standards are an industry-wide practice, not a company of vendor thing. For us to communicate we need to speak the same language, so let's recap…

Analog is film to plate. For the two-piece industry this requires a photopolymer plate.

CTP is Computer-to-Plate. In the two-piece market this a special photopolymer plate with a carbon mask layer.

DLE is a Direct Laser Engrave. This process places an image directly on to the plate, which may be modified polymer, special plastic or elastomer, depending on the laser.

I hope this helps address some of the confusion over plate processing. While this paper is my initial attempt to bring standardization to our industry, I look forward to discussing other subjects, including…

- What are effective resolutions (2400 vs. 2540 vs. 4000 vs. 5080)?
- Is 80 LPI or 100LPI sufficient or should we go higher?
- Are all lasers the same?
- Are all plates the same?
- Are the blankets we use today effective for new plate technologies?

This is just a partial list of questions and subjects. If you have questions or concerns, please email the IMDA so they can be addressed with papers like this, or with conferences and other IMDA venues.

Paul Zeinert
Anderson Vreeland
Direct Engraving Manager
pzeinert@andvre.com