Increasing sophistication in the label industry has created a demand for in-line and cost-effective solutions to meet the label buyer’s needs. Along with many specialty applications, the requirement of the best opacity in white, while maintaining cost-efficiency has finally been met.

Dynamic graphics and special effects can be created in today’s flexographic industry using the right anilox engraving. Due to improved laser technology and the skill in application, there are a number of channeled engravings that work well for creating the high opacity whites, interesting spot varnish effects and eye-catching special effects. Not to be forgotten, the graphic demands for process and expanded gamut have increased dramatically over the last few years.

The tried-and-true technology of consistent closed cell 60-degree engravings has continued to prove to be the choice of many printers, prepress houses and plate suppliers.

**TIPS OF THE TRADE**

- Using the latest plating and prepress technology, combined with the proper anilox engraving specification, it is entirely possible to have smooth transitions where vignettes fade to nothing.
- Four-color process printing is now the norm and expanded gamut printing continues to grow. Complementing this trend, anilox specifications have moved to increased need for engravings with much higher specifications of CPI (cells per inch) – also referred to as line-screen – and bcm (billion cubic microns) – also known as volume.
- Using the right anilox specification and a spot plate, it is possible to create dynamic effects by combining matte and gloss effects in the same graphics. Having the matte and gloss varnish can create increased visual depth in your graphics that allows the product to stand out. The sheen of the gloss spot varnish tends to pull that area to the eye.
- Choosing the anilox engravings with shallow depths and large openings will enable the scented pigments to easily flow in and out of the engravings, resulting in the desired transfer without breaking many of the encapsulations.

**HIGH-END GRAPHICS**

High-end, high definition graphics, requires the precise ink delivery of closed cells and not surprisingly the XLT-60° hexagonal engraving is perfect for those requirements. Gone are the days where “fade to nothing” is not possible. Today using the latest plating and prepress technology, combined with the proper anilox engraving specification, it is entirely possible to have smooth transitions where vignettes fade to nothing.

Additionally, graphic reproduction continues to increase the resolution of the graphic images and thus increase lpi of the polymer, resulting in high-quality graphics being applied to a majority of today’s products. Four-color process printing is now the norm and expanded gamut printing – seven-color—continues to grow. Complementing this trend, anilox requirements have moved to increased need for engravings with much higher specifications of CPI (cells per inch) – also referred to as line-screen – and bcm (billion cubic microns) – also known as volume.

These 1600cpi, 1400cpi & 1200cpi, XLT-60° aniloxs all deliver very specific ink film thickness and enable the reproduction...
of the most high-end graphics in a controlled and repeatable manner. The trend to the higher anilox cell counts is noticeably increasing in both the narrow web market and the wide web market. This trend mirrors the increased graphics improvements with higher plate lpi and the increased use of color and print targets.

Across both narrow web and wide web markets, printers are using print targets that range in density numbers, dot gain tolerances, L’*a’*b’*, and G7 tolerances. The complexity of the color separations and builds require precise ink delivery specifications. The XLT-60° hexagonal has precise structure and shape, for this reason it is the ideal anilox to meet today’s tight print requirements. Engraving of the hexagonal shape can be orchestrated with extreme accuracy, provided the anilox bases and ceramic are precisely and consistently prepared.

**HIGH OPAQI TY WHITES**

Traditionally, in order to achieve high opaque white in flexography, it was necessary to use a rotary screen station. While this approach is effective, it does require setup time and limits the production speed of the press. In addition, should the rotary screen get damaged at any time during production, the change out and re-setup of a replacement screen can be quite time consuming.

Fortunately, today’s anilox technologies offer a great option for achieving the same results in a fast paced productive manner. Channeled engravings such as 30°, 75°, 89°, 45° and weave can efficiently deliver heavy opacity whites for any ink system in use. Using the right anilox engraving, it is entirely possible to achieve opacity levels with solvent inks in the mid to upper 60 percentile, water-based inks in the mid 60 percentile and with UV inks. Engravings have been used with UV inks that have achieved opacity of 70 percent or better.

Engage your ink supplier and anilox supplier in a discussion of your goal and define the percentage opacity you want to achieve. Using the right ink formulation and anilox specification to conduct tests, you will find the right combination that will meet your goal.

**VARNISHES**

Matte and gloss varnishes have been used effectively in the offset industry for years. There has been an increased interest and subsequent use of these varnishes in the flexographic industry as work has transferred to in-line processes. Using new channeling engravings — XTR 89° & 75° — has resulted in smooth laydown of both matte and gloss varnish coatings.

These new type of engravings enable the varnish to flow smoothly from the anilox rolls in the web direction. The benefit of not having cross supports in the 89° XTR engraving and the shape of the channels — large channel opening — enables any coating to flow effortlessly in and out of the channels with minimal disturbance that would result in agitation and foaming. With the XTR engravings, it is common to engrave heavy volumes that can deliver a specified amount of coating, while the anilox remains clean during long pressruns.

Using the right anilox specification and a spot plate, it is possible to create dynamic effects by combining matte and gloss effects in the same graphics. Many ink suppliers have tested the technology and have ready-made recommendations for these applications. Having the matte and gloss varnish can create increased visual depth in your graphics that allows the product to stand out. The sheen of the gloss spot varnish tends to pull that area to the eye.

**METALLIC/FLUORESCENT INKS**

Solids or combination – using metallic inks and fluorescent inks—can truly enhance your product, but have often
been difficult to harness for flexo because of particle size and clumping/agglomeration of the pigments. Those issues have been resolved with the application of channel engravings.

For solids, the anilox engraving requirements will be moderately heavy – between 5 bcm to 16 bcm, depending on testing results for strength. Channel engravings, such as the weave and the 30° channel with low engraving specification, are ideal for the heavy solids. If there is a need for combinations of solids and screens, then the 30° channel and XLT-60° works well.

It is always a good idea to communicate with your ink supplier to review recommendations for specific ink systems. Each ink vendor has different formulation for different inks.

**COLD FOIL & SCENTED**

Cold Foil is another way of creating exciting graphics. Selecting the proper anilox engraving to laydown the right level of adhesive for cold foil allows the application to be run in a very productive setup. The result is a cost effective, dynamic graphic.

Scented inks are another option for differentiating your graphics. We are all familiar with scratch-and-sniff products, but in today’s world they can be done more and more with the flexographic process. Choosing the anilox engravings with shallow depths and large openings will enable the scented pigments to easily flow in and out of the engravings, resulting in the desired transfer without breaking many of the encapsulations.

Sustaining the encapsulation is the key to success and can be done to great effect with today’s variety of channel engravings.

**THERMO-CHROMATIC & TACTILE INKS**

Color changing inks, or thermo-chromatic inks, have long been used in the beer industry, as a positive indicator for a cold beverage. This effect can also be used in other industries to create interesting effects. Applying spot thermo-chromatic inks can be used to enhance specific areas to reveal specific information or graphic elements.

Tactile inks provide a raised effect that is interesting to the touch. Once only found in screen printing, developments in the varnish and engravings have made it possible to achieve desirable effects in flexography.

Channeled anilox rolls with heavy volumes work well to create raised areas for enhancement of the end product. Along with the heavy volume anilox rolls, part of the challenge will be curing the tactile inks. Having at the minimum, 400 watt UV lamps will be required.

Additionally, it might also be necessary to adjust the web path to give the tactile coating additional time to fully cure and set-up. The addition of a mobile curing unit will help capture the raised effect on the web as quickly as possible and enhance the results. The tactile curing unit can be used in a variety of ways – as water droplets, stretching on a baseball, or raised effect on a logo.

**GLITTER INKS**

Large channel engravings work well for these extra-large pigmented inks. Channel anilox rolls with heavy volumes and large openings enable the pigments to tumble and flow into and out of the engraving and onto the substrates. One of the challenges with the large pigments is the need to keep the pigments in suspension in order to properly transfer from the anilox roll to the plate and substrate and that can be achieved with a varnish designed for the purpose.

Along with opportunities for use of these different anilox engravings with these different graphic enhancing inks, comes the need to clean the rolls as soon as each pressrun is finished to prevent lock-up of the carrying vehicle in the cells.

Be sure your current cleaning methods also apply to these specialty applications. As chemistries may not respond, contact the ink supplier for proper cleanup instructions for those formulations.

Today’s anilox technologies can truly help to enhance the various graphics, thus differentiating your product against the competition. To take advantage of the opportunity of these different ways to create dynamic graphic effects, it is necessary to do your homework.

Coordinate with your anilox supplier and ink suppliers. Schedule banded roll print trials to determine what combination of ink and anilox works effectively. Put together banded roll layouts that include a variety of different engravings targeted to address your goal.

A banded roll trial will also enable you to test other variables, such as drying or curing requirements, and press setup. During testing, you should also determine optimum press speed. We have found that testing the new plating technologies, along with different stickyback and polymer can truly make a difference.

Using the right anilox technology and coordinating with your ink and anilox suppliers, it is truly possible to create and print dynamic products.

---

About the Author: **Alexander James is the director of Harper GraphicsSolutions, the technical division of Harper Corporation of America, Charlotte, NC. Alex has a Master of Science degree in graphic communications from Clemson University and a Bachelors of Fine Arts from the University of North Carolina, Asheville. With more than 20 years of experience in the graphics industry, Alex has presented at numerous industry related events. Alex has traveled globally, nurturing and developing business relationships by assisting customers in establishing print workflows, improving efficiencies and productivity.**