



## INNOVATIONS IN DIGITAL DECORATING

# The Power *of* Black & White

By Bill Leek

I have a passion for black and white photography. Although a large portion of my professional career has been involved in optimizing full-color composition and reproduction, I have always been aware of the power and drama that can be created by a single black and white image. I still remember when I was a boy, sitting in my grandmother's living room inspired by her books filled with

black and white images by Ansel Adams and the other great photographers of the twentieth century.

This article focuses on transferring black and white photographs to aluminum using laser engraving and dye sublimation techniques. It will investigate image selection and software enhancement, aluminum material selection and equipment requirements and techniques.

### WHAT MAKES A GOOD BLACK AND WHITE PHOTOGRAPH?

An excellent black and white photograph should contain strong contrasts and shading. The dynamic range (between the whitest and darkest area in the image) should be as high as possible. The photograph should contain interesting details and textures. In addition, it should contain strong lines and shapes that direct the viewer's eye to the important image areas. High contrast creates excitement. Lower contrast creates a soft feel. In portraits of women and children, you may want to soften the skin while adding contrast and detail to the eyes, hair and other features.

There are several image-processing software tools designed to enhance black and white photographs. I have used Photoshop, PhotoPaint, Lightroom, Nik Silver Efex Pro, Topaz BW Effects, Topaz Adjust 5 and Portrait Professional 11 with excellent results. These tools may be used to enhance images for both laser engraving and dye sublimation.

### LASER ENGRAVING ALUMINUM: IMAGE QUALITY

The quality of a laser-engraved aluminum photo directly depends on the focus, resolution, noise and halo effects present in digital camera and scanned images. If you are going to engrave an image at 500 or 600 dpi, the source image has to respectively be 500 or 600 dpi or greater. In Photoshop, if



(top) Gold AlumaMark laser engraved photograph from Epilog.  
(above) Johnson Plastics created this silver AlumaMark detailed engraving.

# Use laser engraving and sublimation to create exceptional black and white images on aluminum.

you need to enlarge image size/resolution, make sure you select BICUBIC SMOOTHER as the resampling method in the IMAGE SIZE menu.

Noise in a digital image can be another problem. There are three types of noise to look for:

- JPEG artifacts.
- Noise created when a digital camera utilizes a high ISO setting.
- Halos created by various sharpening methods.

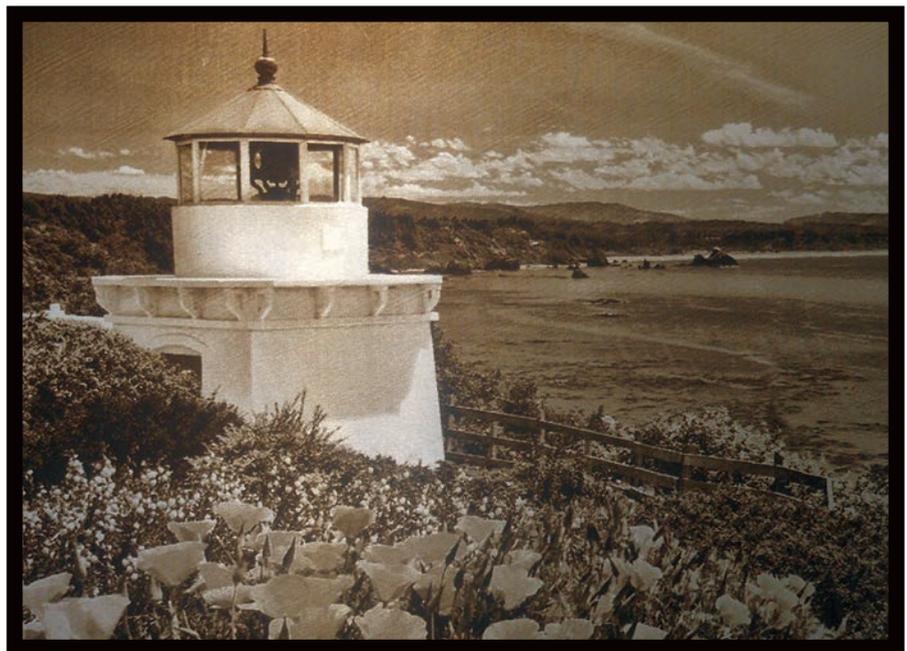
In addition, if you are scanning a photo, make sure you spend the time to clean up any dust or scratches your scanner or pre-processing software did not eliminate.

## CONVERSION TO 1 BIT FOR ENGRAVING

The enhanced grayscale image must be converted to a 1 bit black and white raster image for output to the laser engraver. There are several software options available to accomplish this:

- Photo Laser Plus™ which is embedded in Cadlink's Engravelab software. This package is distributed by Epilog.
- PhotoGrav 3.
- Universal's 1-Touch Laser Photo™
- CorelDraw PhotoPaint™

All four packages perform good conversions. Each has specific strengths and features. PhotoGrav and Photo Laser Plus offer simulation images of final output that reflect the material used and laser settings.



Note the slight tan tones on silver AlumaMark seascape.

The simulations are relatively accurate and demonstrate the effect of small changes in speed and power settings. This can save both production time and material. Universal's exclusive 1-Touch Laser Photo™ software automatically applies filters to adjust contrast, exposure and other settings. Corel PhotoPaint allows you to select which diffusion method to use for the grayscale to black and white conversion.

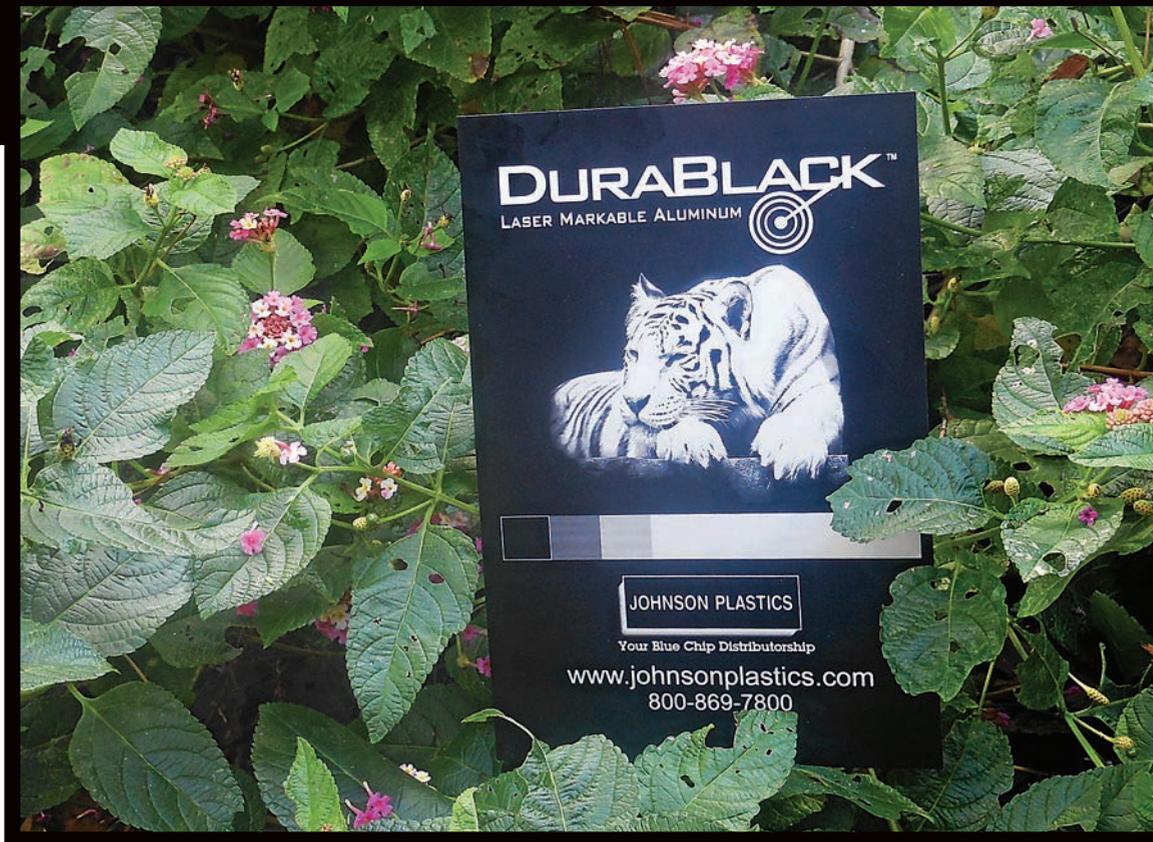
## ALUMINUM SELECTION

Laserable aluminum is durable and has a high perceived value. Several products are available that will produce good photo reproductions. Laser metals can be divided into three categories:

- Coated Engravable
- Positive Transformation
- Bleachable

Three aluminum products are presented in this article:

**DuraBlack is designed for extended outdoor use and harsh environments.**



**Black Anodized Aluminum** is a bleachable product that produces white on black results. It is suitable for outdoor use and provides the necessary contrast and detail for photo engraving. The dynamic range between the bleached white engraving and black substrate is very good.

**AlumaMark™** from Horizons Incorporated is a Positive Transformation product that produces variable shades of black and great detail reproduction. It is offered in a variety of silver, gold, brass, and bronze metallic finishes and solid colors. All finishes are available in 12x24, 0.02 sheets. Silver, gold and brass are also available in 20x24. A very thin (0.005) flexible sheet comes in silver and gold and in five color packs. Satin silver is a particularly good finish for photographic reproductions. AlumaMark is designed for indoor applications and is considered a medium priced substrate. It can be utilized outdoors with an overlamine.

Power and speed settings are critical when using AlumaMark. Initially you will have to experiment to find the "sweet spot" settings for your specific laser. Typically, low power (5-15W) and high speed is recommended. The settings for the image of the boy and the lighthouse on a 50-watt laser were 17 power and 80 speed with 500 dpi resolution. A little less power was used to create a black with

a little red/tan in it. This gave the final image an antique or heirloom feel. The very slight under-mark produced a very creative effect. This capability differentiates AlumaMark from the other substrates I have evaluated.

The wide range of finishes and colors, combined with excellent graphic capabilities and options, make AlumaMark the product of choice for aluminum photo engraving.

#### **DURABLACK™ LASERABLE ALUMINUM CONQUERS THE GREAT OUTDOORS**

For years I have searched for a black laserable aluminum product for outdoor signs, markers, equipment tags, barcodes and panels. Last year, Horizons Imaging Systems Group (ISG) released DuraBlack, the first engravable aluminum product that can last 8 to 10 years in a variety of harsh military, industrial and outdoor operating environments without a protective topcoat. DuraBlack fully meets the requirements of MIL-STD-810G for resistance to abrasion, temperature, weather, salt spray and fluid exposure. DuraBlack performance far exceeds that of black anodized aluminum and laser markable acrylics. Horizons has performed extensive laboratory testing to verify durability, including Xenon weather/UV, Abrasion

Resistance, High Temperature Resistance, Salt Spray and Chemical/Fluid Resistance.

DuraBlack produces durable, high-resolution bright metallic images and text on a matte black background. The engraved visual appearance is excellent. The product is composed of a two-part thermoset coating bonded to either 0.005" or 0.020" thick aluminum. It can be easily attached to curved or flat surfaces with adhesive, rivets or screws.

The recommended manufacturer's laser settings for DuraBlack are:

- **Speed** - between 60-80%. Some dwell time is needed to create a good mark.
- **Power** - about 15-20 watts (50-watt laser should be set at about 35%).
- **DPI** - set at 600dpi or higher.
- **PPI** - set as high as possible (at least 1000).

These settings should provide a good starting point, but a little trial and error will be required for optimum results. DuraBlack was not designed specifically for black and white photo reproduction. It is difficult to obtain detail in highlight areas. Johnson Plastics has created some decent photo examples (see illustration) by reducing both the speed and power using a 50-watt laser.

Overall, DuraBlack is the best laserable aluminum substrate for extended outdoor use. Print and vector imaging is excellent.

**BLACK AND WHITE  
SUBLIMATION PRINTS ON  
CHROMALUXE™**

When you think of dye sublimation transfers, the vision of vivid, full-color prints is probably the first thing that comes into your mind. The use of dye sublimation to create black and white photos might seem to be counter intuitive—actually it's a perfect match.

There has been growing interest in the photographic community to digitally simulate film types, grains, processing techniques and toning used through the years in analog photography. These simulations need to be accurate, authentic, and easy to apply.

ChromaLuxe from Universal Woods is an established metal photo substrate available in both white and clear finishes. The coated surface is as smooth as glass, and the aluminum is 0.045 thick. ChromaLuxe sublimates extremely well and is scratch, UV and heat resistant. Its archival qualities insure long-term indoor exhibition without image fade. In addition, with the right equipment or processing service, you can create a range of print reproductions from small desktop photo sizes to huge multiple wall panel arrangements.

When simulating black and white with sublimation inks, it is mandatory that an accurate ICC color profile is employed. A grayscale that is linear without color hue variations is critical for good black and white transfers. Often it is necessary to edit your color profile to linearize the grayscale. If you have RIP software, you can linearize your printer using a separate procedure. It is often necessary to generate a second color profile for black and white. As this second profile will often change other colors, you must save the edited profile with a new name, and use it only for black and white images.

Epson has developed excellent ink sets for both color and black and white photography. I printed several black and white targets and test images on an Epson 2400 printer using their professional profiles. The printed targets provide an ideal reference when editing the black and white sublimation profiles.

**CLOSING THOUGHTS**

This article should not be viewed as a competitive comparison between laser



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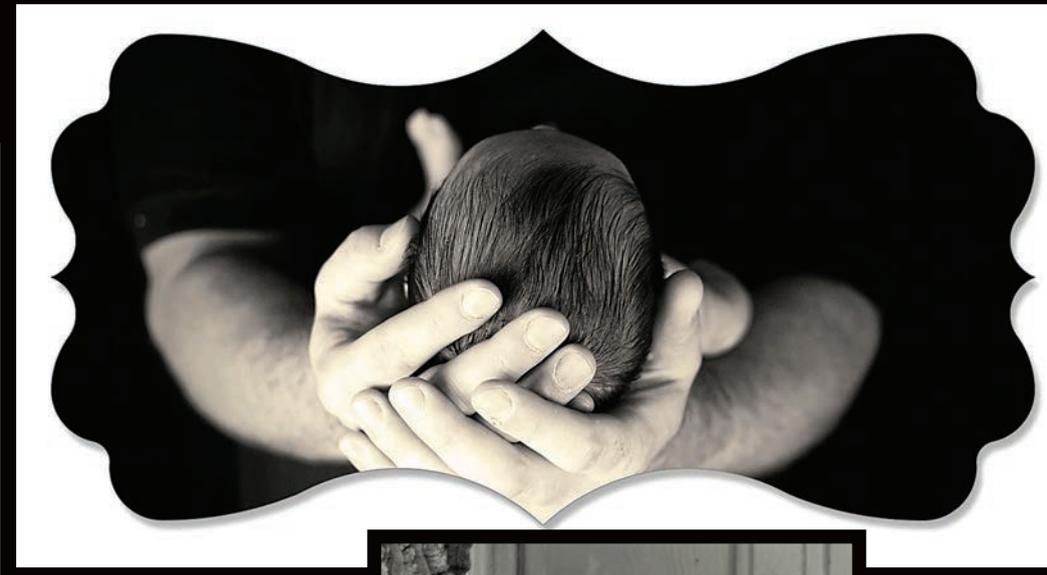
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(above) This sublimated ChromaLuxe Creative Borders wall panel features black and white with selective color tint.

(right) Simulated platinum ChromaLuxe sublimation print.

(below) Tinted, contrast enhanced ChromaLuxe seascape.



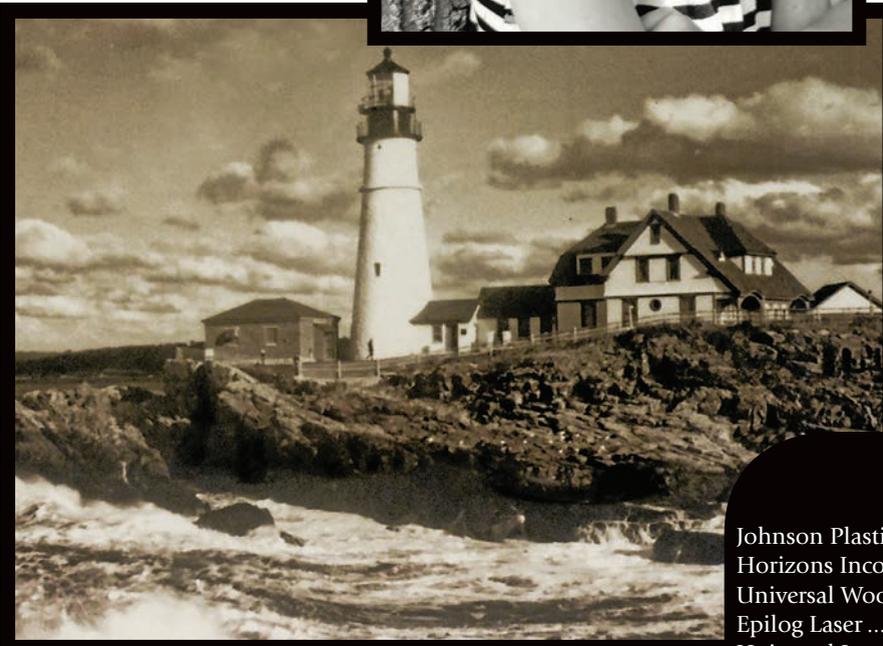
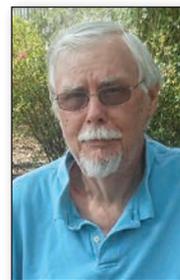
engraved and dye sublimation black and white photo reproduction. The two processes are complementary and offer finished products with very different looks.

Lasered products offer a detailed, high-contrast look and a timeless, heirloom quality with high perceived value. The laser-engraved image should not be an exact copy of a printed photograph.

Instead a photo should be modified to create an exemplary lasered image with a distinctive finely engraved look.

ChromaLuxe allows the creation of professional and accurate reproductions on white and clear thick aluminum panels. A good sublimation transfer to aluminum should meet and exceed the quality of prints created at a custom photo processing lab. Thousands of variations in grain, tone and exposure can be simulated, offering almost endless creative possibilities. **A&E**

*Bill Leek of Houston, Texas, has over 33 years' experience in digital decorating system development and graphics design. He has developed several lines of color imprintable products utilizing inkjet, sublimation, and color laser transfer technologies. In addition, he has extensive working knowledge of color management and product durability testing and has consulted for many of our industry's leading companies. He may be reached at [wfleek@jblgraphics.com](mailto:wfleek@jblgraphics.com).*



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