A PHOTO AND ITS ELEMENT (13)

T h e A l l u r e o f A l u m i n u m

ALASKA SOCIETY OF OUTDOOR & NATURE PHOTOGRAPHERS

www.asonp.org/alaskawild

Created and presented by:

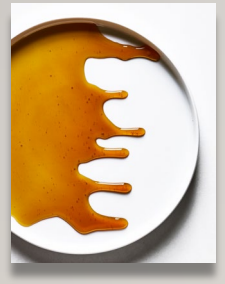
Jen Corbell - 2023

All images are royalty-free Microsoft 365 stock images.

WHY PRINT ON ALUMINUM / METAL?

- Command attention in any lighting situation with magical luminescence. Light reflects through the print.
- Bring images to life with more 3-D image depth.
- Vivid, bright, dynamic colors that no other medium can replicate.
- Contemporary, sleek, stylish, ultra-modern. A clean look, with no framing or matting needed.
- Built to last, archival and durable. Provides print longevity, resistant to most abrasions, moisture-resistant, waterproof surface, stands up to humidity better than other substrates – ideal for all environments. Flame/smoke resistant, generally fade resistant.
- Great for exterior display or in direct sunlight (with UV coating), or as signage.
- Easy to clean. Can be washed without smearing or damaging the image.
- No glass (or acrylic) to cause light interference when viewing the print.
- Many display options mounting & framing. Easy to hang and lightweight.

2 TYPES OF PHOTOGRAPHY PRINTING METHODS



- **Directly <u>on</u> the surface / Paper Prints and Other Flat Surfaces:**
- Inkjet or laser printing is similar to video imaging.
- It is essentially seamless and detailed; however, when magnified, you can see the primary color dots of the image. Printing is typically line by line.

- **Embedded <u>into</u> the surface / Metal Prints and Other Substrates:**
- Dye sublimation process is similar to traditional film photography.
- Like the use of a film negative during printing, a consistently blended color or tonal range of the image is printed as an All-Over-Print (the entire image) at once.

IMAGE ON THE SURFACE – PAPER PRINTS

- Generally produced by ink jet & laser printers
- Other examples include screen printing and commercial CMYK press printing.
- A commercial press prints an entire page, however the ink *resides on the surface of the paper*.
- Liquid ink is distributed through the printer from cartridges, and solidifies by air, as it dries on the paper's surface.
- Prints line by line. Ink jet controls where ink droplets spray onto the media from it's cartridge nozzles. The cartridges move from side to side producing a spectrum of color through the placement of these microscopic droplets.
- Only uses the required amount of ink needed for the print. More efficient than embedded printing.

IMAGE EMBEDDED INTO THE SURFACE

- Requires a Dye Sublimation Transfer Process (2 steps) - meaning the image is *infused* into the aluminum sheet, instead of resting on top of it.
- Image becomes clearer and more radiant from the dye bonding (**at a molecular level**) to the reflective surface of the aluminum substrate.
- Must use specific printer, transfer paper, special inks (not ink jet or pigment) and a heat press.
- Extra ink is "wasted" and will remain on the transfer sheet because it won't completely bond to the substrate when the molecules are at the maximum capacity of image ink.

WHAT IS SUBLIMATION PRINTING?

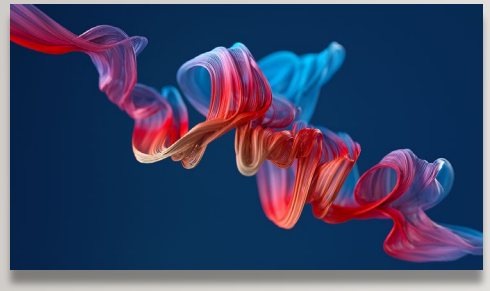
- Invented in 1957, by French researcher Noel de Plasse, who was employed at a textile company named "Lainiere de Roubaix". Eventually his discoveries led to the founding of a company named "Sublistatis SA" – that was dedicated to commercializing the process.
- The name "Sublimation" was first used because the dye was thought to make the transition between the solid and gas states without going through a liquid stage.
- Later this was shown to be incorrect; there is some liquefication of the dye during the printing/transfer process.
- Dyes will bond with synthetic polymer fibers and plastics; **unlike natural fibers, which allow gaseous ink to pass straight through the material.**
- Direct-dye sublimation is sometimes applied to a variant of digital textile printing using sublime inks printed directly onto fabric, which then is heated to set the dyes without the transfer sheet.
- The proper name for the 2-part process is "Dye Diffusion", however, it was never adopted over the original name.

SUBLIMATION TWO-STEP PROCESS

- **ONE:** A printer with a specialized CMYK liquid ink and a spectrophotometer (needed to ensure color accuracy) is used to print the image onto specially coated, **heat-resistant transfer paper**. The ink dries and becomes a solid which is similar to a traditional surface print.
- **TWO:** The transfer paper is placed into a heat press with the aluminum plate for vaporization of the solid ink in order to transfer the image to the substrate surface.
- Ink on the transfer paper grows hot so fast it skips the melting process and immediately evaporates.
- Meaning, in slow-motion, **heat opens the pores of the surface and infuses the image into the fibers**. This allows the ink to bond with polyester and polymer-coated molecules on the metal plate. Once the heat is removed, the pores close and the ink shifts back to solid form. Any remaining ink is left on the transfer paper and/or is emitted as a vapor.

CONTEMPORARY SUBLIMATION PRINTING

- Common for apparel, signs & banners, novelties such as cell phone covers, plaques, photo tiles, coffee mugs, mouse mats, and many other dimensional surfaces.
- Better if product is made of rubber, synthetic, blend fabrics, or plastic.
- Popular for cycling jerseys or athletic clothing due to longevity – images will not flake off or fade.
- Other surfaces like metal require a polymer coating for molecular adhesion or a sprayed sublimated coating on the surface to prep it. With natural fiber surfaces, the image may be printed onto another surface first then secured to it. For example: no cotton or organic fabrics, printer paper, labels or envelopes, etc….
- The 2-step transfer process consisting of 3 main aspects: **Ink, Heat, and Surface**.



INK - DYES

- Originally large-format printers used a thermal printhead to transfer dye from a ribbon directly onto the print media. Later, modified electrostatic plotters used toner for full page printing with pre-press proofs.
- Now inkjet printers with special ink technology exists in ID card printers and dedicated photo printers (dye diffusion thermal transfer – also known as D2T2). Special dye-sublimation transfer laser printers also available.
- Two types of inks: 1). Aqueous for both desktop & large format printers 2). Solvent for some printhead wide-format printers. Eco-solvent inks are growing in use.
- **Sublimation inks are transparent, so the transfer paper surface color is very important. (White or clear).**
- Accuracy of the colors is incredibly strong given the specificity the vaporization allows over standard inkjet droplets. Vapor is a fine mist.
- Great contrast and color saturation are enabled by pink and yellow fluorescent inks.
- Longer lasting than traditional inks. Will not wash off or peel. Waterproof. Process makes it smudge-proof. Clear protective coating added to inks or coated onto final image surface. **No limit on colors or complexity of the image, only limited by what printer can print.**

HEAT

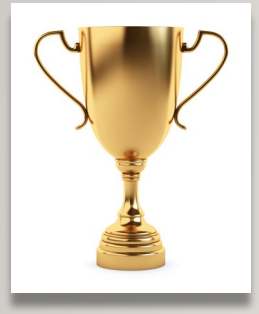
- Heat press – uses a combination of **Time, Temperature, and Pressure**.
- **Different settings are used depending on the substrate.** The dyes transfer at a molecular level into the polymer coated substrate, versus at a topical level (such as screen printing and direct garment printing). The most common temperature for transfers is 350*F, however, temperatures ranging 380-420*F is normal for optimal color.
- Image is printed onto coated, heat-resistant transfer paper as a **mirror-image** of the original.
- The reversed image is placed face down with the metal under the transfer paper and secured with heat-resistant tape. This allows the heat press to directly touch both the metal and paper.
- The image sheet is then pressed onto the surface, transferring the dye to the substrate (plastic, fabric, metal, wood etc…).
- It is considered an indirect process since the substrate doesn't pass through the printer and the sublimation occurs separately.

ALUMINUM – ELEMENT 13

- Discovered by Hans Christian Orsted in 1824.
- Hans was a physicist and chemist, and also considered the leader of the Danish Golden Age.
- Known as chemical element “Al” and atomic element number “13” of the groups nitrogen-phosphorus, oxygen-sulfur and the halogens on the Periodic Table.
- It is highly abundant and the 12th most common element in the universe.
- This metal is soft, has poor mechanical strength & a lower density than common metals. Its lower melting point, directional bonding effects, and highly reflective “fingerprint” (consisting of spectral lines found in the elemental nature of its atoms) make it a very conducive surface for exceptional photography prints.
- Melting point is 1220.58*F and boiling point of 4478*F.

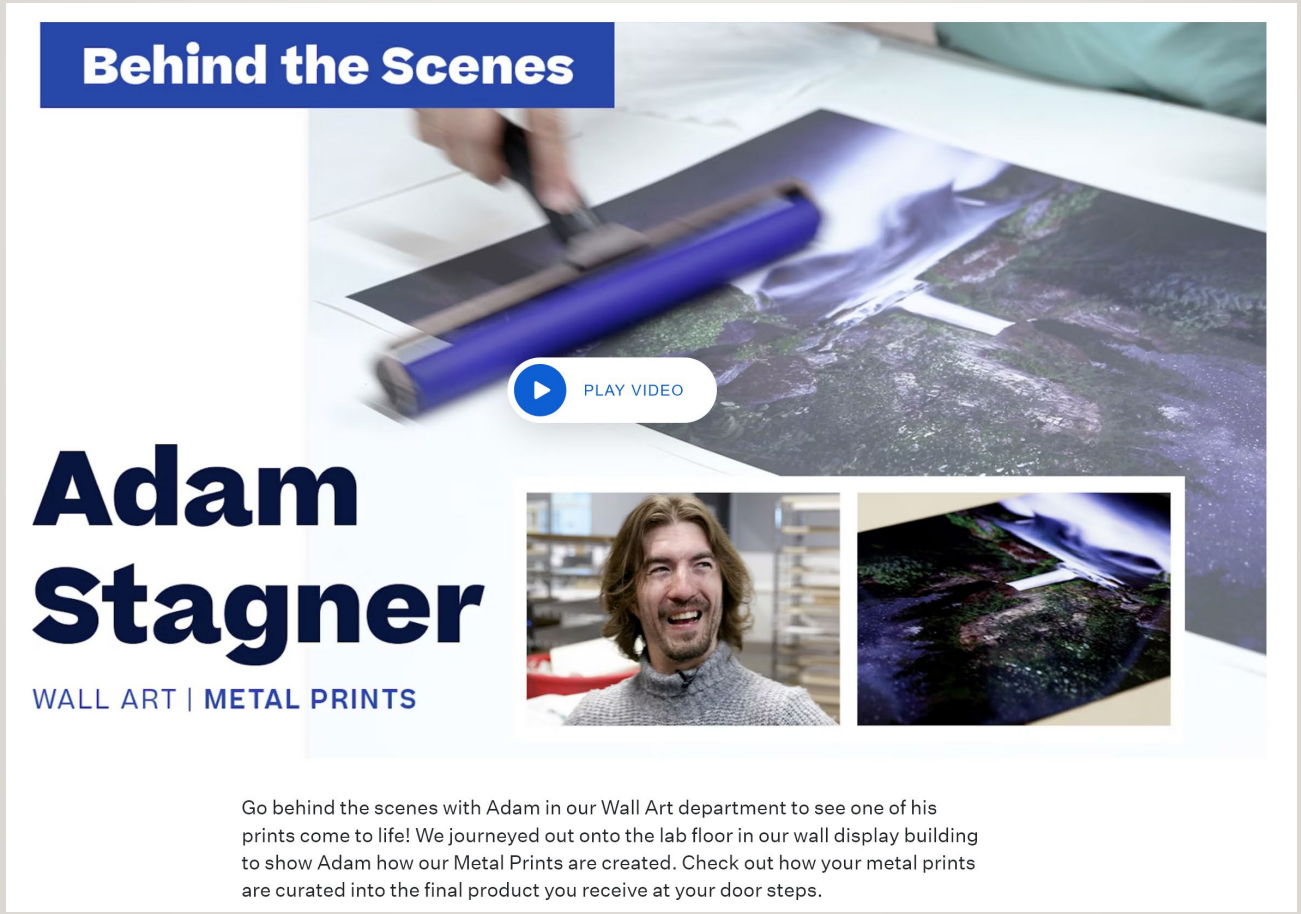
SURFACE

- Printing prep: The aluminum panels are manufactured with high-performance polymer and outdoor UV coatings applied.
- The coating inhibits growth of bacteria, allows for easy cleaning, and is waterproof.
- Other surface choices include high gloss, semi-gloss, matte finishes, and UV for exterior/direct sunlight/windows exposure.
- **White Base transfer paper** is a smooth, bright, and opaque enough base that the metal will not show through the image when the transparent inks are applied. It is the most popular choice and recommended for realistic skin tones. It also enhances the beautiful, vivid colors found in nature shots like landscapes, flowers, animals and water.
- **Clear Base transfer paper** allows the raw brushed metal to show through the image when the transparent inks are applied, especially in white or light-colored areas versus the dark-colored areas of an image. This makes more industrial subjects like abstracts with texture and depth, motorcycles, cars, and cityscapes look stunning.
- The sublimation result is a permanent, high-resolution, full-color print with no cracking, fading, or peeling under normal conditions.
- Colors can be extraordinarily brilliant due to the bonding of the dye to the transparent fibers of the synthetic fabric; with truly continuous tones, no half-screen printing and can be printed as one entire item, with no difficulty occupying the surface all the way to the edges.



FILE PREP

- Calibrate your computer monitor!!!
- Color correction services offered. Watch for skin tone balances, blown out highlights, & color casts (wrong white balance).
- RGB Color Profile – Adobe RGB, sRGB and P3
- Jpeg quality 10 or higher / Photoshop
- Quality 90% in Lightroom or other programs
- 300 DPI (dots per inch)
- Printing company can resize (or you resize and apply sharpening for precise control)
- Optional enhancements - Use AI resize, sharpening, denoise programs
- Watch over correcting images; halos and chunky pixels are very noticeable on metal
- Order small test prints of your image or generic sample packs of the different finishes on the aluminum metal surface.



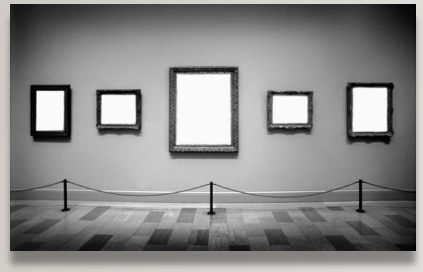
Adam Stagner - Tennessee Landscape photographer
WHCC video
https://www.whcc.com/inspiration/for-the-love-of-a-lifestyle-adam-stagner/#metal-1

RECOMMENDED PROFESSIONAL PRINTERS

- Both companies are top quality, and have great customer support / resources

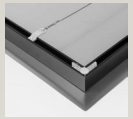
- **Bay Photo** / Scotts Valley, California www.bayphoto.com
- ChromaLuxe coatings

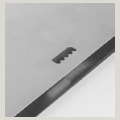
- **White House Custom Color** / Eagan, Minnesota www.whcc.com
- alaskaWILD uses WHCC – partner with PhotoShelter



DISPLAY CHOICES

- **<u>Hanging Methods:</u>**
- Inset frame with traditional picture wire
- Framed float mount print
- Double float mounts
- Metal posts - attached by holes through print (different sizes & colors)
- Metal cleat (saw tooth) on back





- **<u>Other Options:</u>**
- Table stands, easels, or display blocks
- Easel backs (attached to print)


- Magnet backing
- Creative cut edging
- Rounded corners are common to prevent damage

DIY: MODIFIED HOME PRINTERS & INK BRANDS

- Must use sublimation inks.
- Get adapter kit or CISS (Continuous Ink Supply System) or look for auto fill bottles.
- Suggested Ink Brands:
- **Hiipoo**
- **Printer's Jack**
- **Cosmos**
- Suggested Printers:
- **Sawgrass**** (ease of use and support)
- **Epson** SureColor F170
- Modified/Converted:
- **Epson EcoTank**** with Hiipoo inks (price & convenience)
- Epson Workforce with Printer's Jack ink

DIY: SUGGESTED PAPER BRANDS & HEAT PRESSES

- Must use sublimation paper. Regular and large format sizes available. Laser copy paper will make prints look more faded and washed out.
- Use ICC color profiles for the specific paper.
- **A-SUB Paper** or **TruePix** brands are good.
- Non-commercial heat transfer paper is less expensive and sits on top of the material/substrate in a thin layer. It can decrease in quality by cracking and/or fading.
- Software: Dye Sublimation or Transfer Express for managing designs/images and settings. RIP (Raster Image Processor).
- Make sure software is compatible with printer.

- Heat: **Tusy** brand heat press.
- Can use convection oven, or air fryer to heat up to 400* (heat gun & household irons not as good….they don't get hot enough).
- Use protective (uncoated) paper to avoid messes. Vapor can blow out onto nearby surfaces.
- Use Heat resistant tape to keep prints in place.
- Anything laminated can be sublimated.
- Use internet for more information

CARE OF METAL PRINTS

- Metal prints will eventually collect dust and finger prints.
- Always use a micro-fiber cloth to wipe the surface; or cautiously use very mild soap and water, or gentle cleaners for stubborn spots.
- Avoid rough scrubbers which could leave scratches on the surface if too much pressure is applied, potentially leading to quicker fading and possible erosion of the metal prints.
- Read cleaning product ingredient lists, to avoid ammonia. Also note that chemicals from cleaners might react with the print if it contains any harsh acids, possibly burning or harming the metal and/or causing pits and bubbles on the polymer surface.
- The metal can be prone to corrosion, so monitor kitchens and bathrooms (or other moisture areas) more frequently.

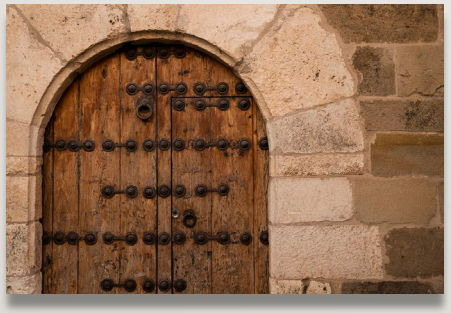
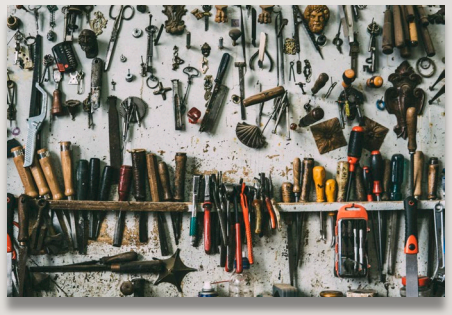
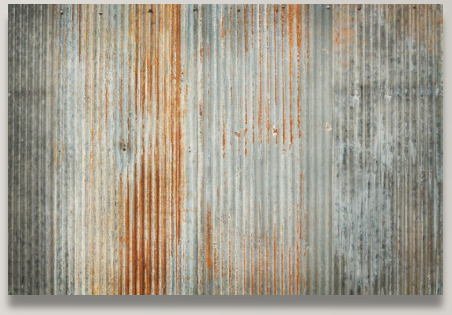
SUNLIGHT EXPOSURE

- Be aware that ALL prints (Paper, Metal or Other) can/will fade over time if not properly protected.
- Metal prints will fade very slowly (years) due to the nature of the embedded ink, however, they will fade much faster in direct sunlight if a UV coating has not been applied.
- For a more dimensional look, hang them near a window to let the light hit the print and reflect through the surface.
- Remember direct sunlight is not recommended over extended periods of time, rotate display locations to avoid prolonged exposure.
- If you wish to hang your metal prints outdoors and they do not have UV coating, look for a spot that gets the least amount of direct sunlight; for example, in the shade, or under artificial lights.

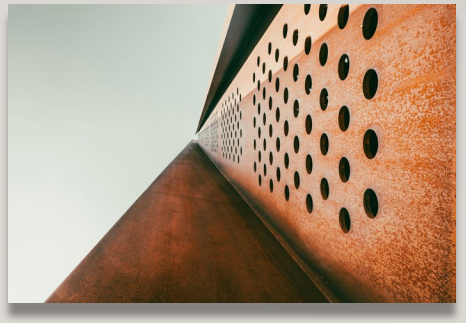
SHOOTING METAL AS A SUBJECT

- Which printing base is appropriate for the subject? - clear or white
- What characteristics and details of the subject are you attracted to?
- Old / Weathered / Rusted
- Shiny / New / Reflections / Wet
- Abstracts & Lines
- Color / Texture / Patterns
- Composition

OLD / WEATHERED / RUSTED





SHINY / NEW / REFLECTIONS / WET







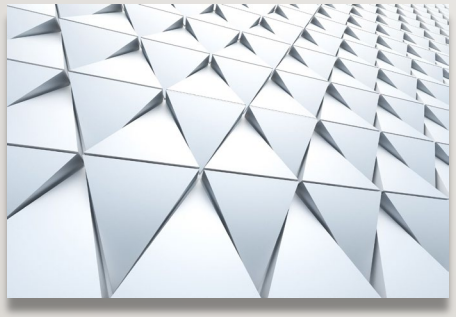

ABSTRACT & LINES







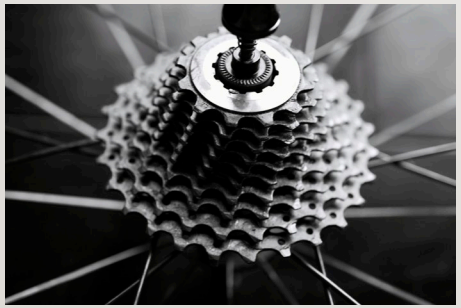

TEXTURE AND PATTERN

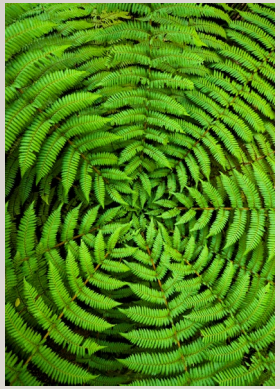



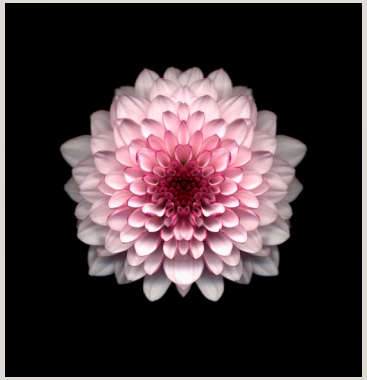




PARING AND DOUBLE EXPOSURE IDEAS







Line / Pattern

Color / Texture

Shape / Light & Shadow

PHOTO WALK

SUBJECT

- Choose a metal characteristic as your theme
- No wrong answers (images)
- Have fun!

SCHEDULE

- Shoot photos until noon
- Lunch 12:00 – 1:00pm
- **Drop off photos that you want to share between12:00-1:00pm**
- Gather at 1:00 to look at everyone's photos