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Maximizing the Power of UV Printing and Laser Engraving:

Advanced Techniques for Personalization Pros

Meet the Presenter



SUSAN COX

CEO and Founder

LOGOJET™

- + 20 Years – Manufacturer of direct to substrate printers with direct sales model
- Headquartered in Lafayette, Louisiana
- Born in Toronto, ON Canada
- APA Board Member 2019-2021
- Tradeshow Committee Chair 2020-2025
- APA Supplier of the Year 2024
- Favorite Core Value: Find Solutions



Agenda

1. **Learn advanced UV + laser applications** — examples of product created with layered material mix, textured print, and full-color designs that go beyond standard logo printing.

2. **Understand design strategies** - improve design techniques to increase quality, reduce waste, and simplify setup across both technologies.

3. **Gain workflow optimization techniques** - increase output and efficiency by creating scalable workflows.



You’re Here Because You Already Have the Tools



You have:
✓ A laser engraver
✓ A UV printer

And like most shops —
You’re using them…But not always **together.**

You’re here because you want to:

- Create higher value products
- Move beyond generic printing
- Maximize the equipment you already own
- Do more without buying more

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The Market Shift
Why Simple Logos Aren’t Enough Anymore

- Flat Award



- Added Material Layering





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Top UV + Laser Combos That Sell Themselves

- Textured Medals & Medallions
- Lapel Pins
- 3D Crystal
- Patches
- Layered Awards
- Textured Florentine Plaque.
- Layered Acrylic Awards
- Keychains
- Art Pieces



Acrylic Key Chains
→ SINGLE LAYER



1/8” CLEAR ACRYLIC KEY CHAIN



SIDE VIEW



BACK VIEW





SIDE VIEW



1/8” CLEAR ACRYLIC KEY CHAIN

BACK VIEW



Acrylic Key Chains
→ DUAL LAYER



1/4” DOUBLE LAYER ACRYLIC KEY CHAIN



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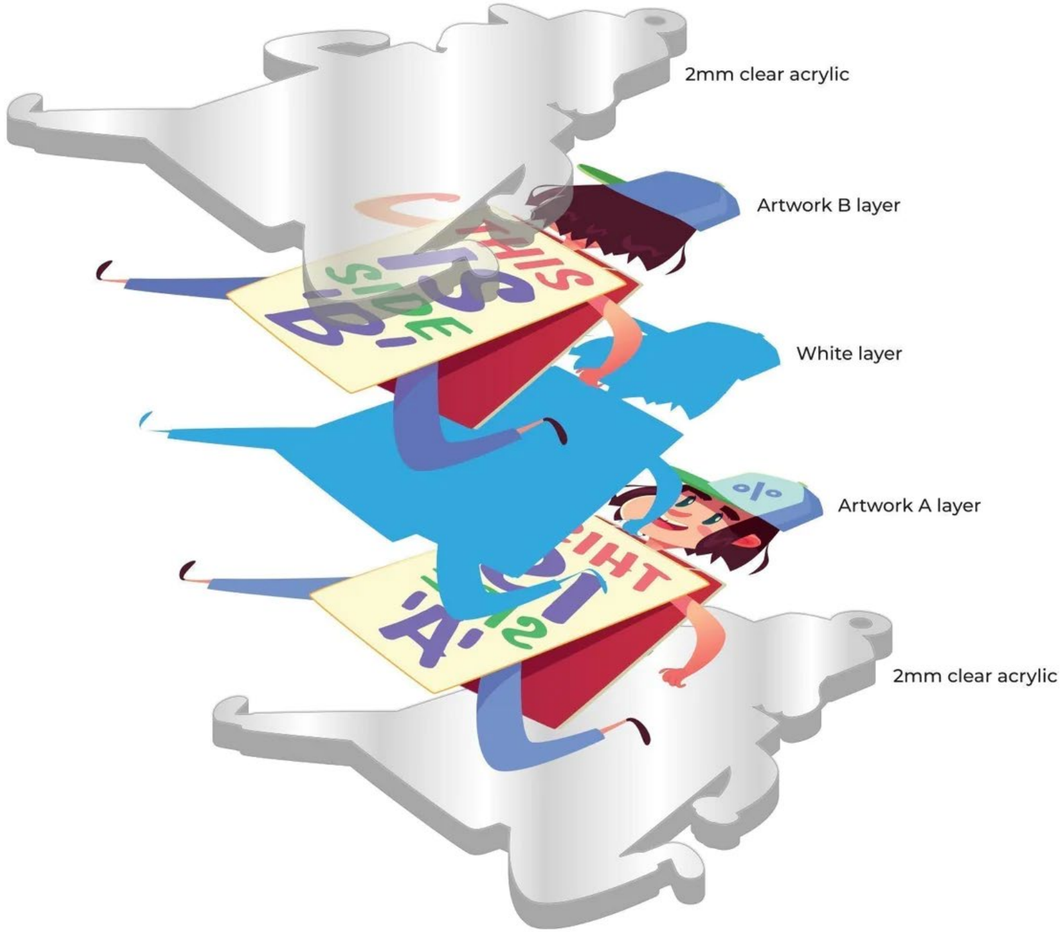
Acrylic Key Chains
→ DUAL LAYER PRINT TIPS

- Print leaving 2mm border to laser cut line
- Print BOTH SIDES so that you can see same image on both sides – UPSELL!
  - Mirror Color Layer back side of acrylic
  - White
  - Artwork B color print
- *For single acrylic keychain layer print, add Clear Gloss as protective layer against keys, etc*





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Acrylic Key Chains
→ DUAL LAYER BONDING TIPS



Manual (Low Volume)

- use Weld-On/SCIGRIP #4 Liquid Solvent for Bonding Acrylics.
- Tape bottom edges leaving ~0.3 mm gap
- Align layers flat
- Inject solvent slowly from one side
- Capillary action pulls adhesive across seam
- Let cure fully before handling

Automatic (High Volume)

- Use an automatic acrylic bonding machine like: Glueasy
- Consistent solvent flow. No squeeze-out haze. Higher throughput. Bubble-free seams. Better optical clarity

- Leave protective mask on during cutting to prevent edge flash before bonding.

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Textured Medallions and Challenge Coins

→ Die-struck look, quick production.

Upsell: Texutre + Varnish





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Textured Medallions and Challenge Coins

Creating the Graphic File

- Image prepared in Adobe Illustrator of full image with spot color and indicated textured areas.



Layer 1: White Only

- The white base will be choked underneath to ensure it does not go outside of the color top Print.



Layer 2: Color Only

- This area will be translucent and reflect show some of the natural shine of the metal underneath.



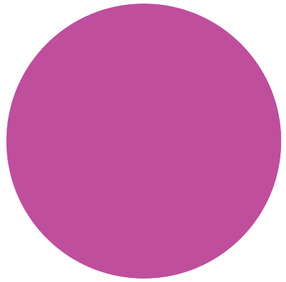
Layer 3: White Texture Only

- Image prepared in Adobe Illustrator of full image with spot color and indicated textured areas.



Layer 4: Clear Gloss Only

- Full image flooded with a clear varnish later.





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Lapel Pins

→ Raised UV = enamel look. *Upsell: Gloss Resin look*



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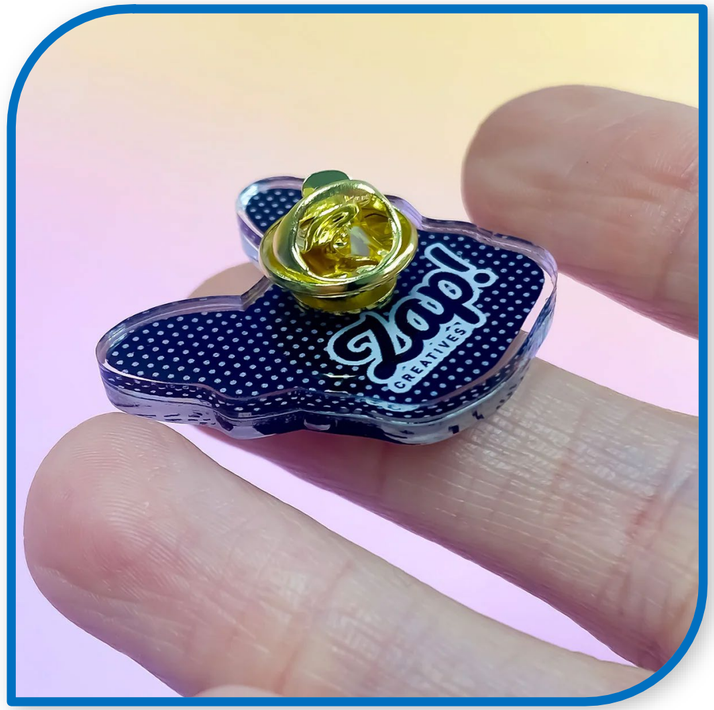
Lapel Pins

→ Laser cut acrylic and wood + UV Print







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Level Up the 3D Photo Crystal: From Floating Image to Full Scene



What's Typically Done Today:

- Blank crystal with internal 3D subsurface laser image
- Monochrome etch creates a "floating" effect
- Beautiful — but often visually incomplete without background or context

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Level Up the 3D Photo Crystal: From Floating Image to Full Scene



Advanced UV + **Laser Enhancement:** Why stop at the internal image?

Step 1: UV print full-color background artwork to the *back side* of the crystal. Mirror image, Print UV Color layer

Step 2: Add a **white ink layer behind the color** for opacity and contrast

Result: Background scene enhances depth

and visual storytelling

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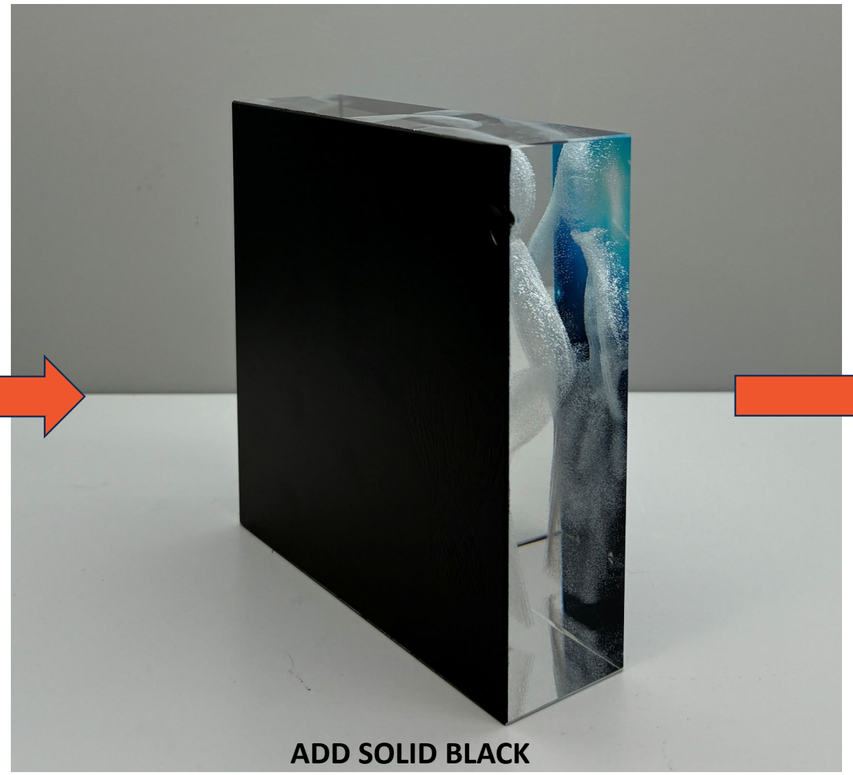
Level Up the 3D Photo Crystal: From Floating Image to Full Scene



STANDARD BACK IS WHITE



ADD SOLID BLACK



NEW GRAPHIC FILE (WHITE + COLOR)

Advanced UV + Laser Enhancement: More real estate on other side to upsell!

Step 3: on the back side, add a solid black print file using Color Only layer

Step 4: Change your graphic file and print white + color layer

Result: Clean front aesthetics with a blocked back layer to support a second graphic—turning a single print into a higher-value finished product.

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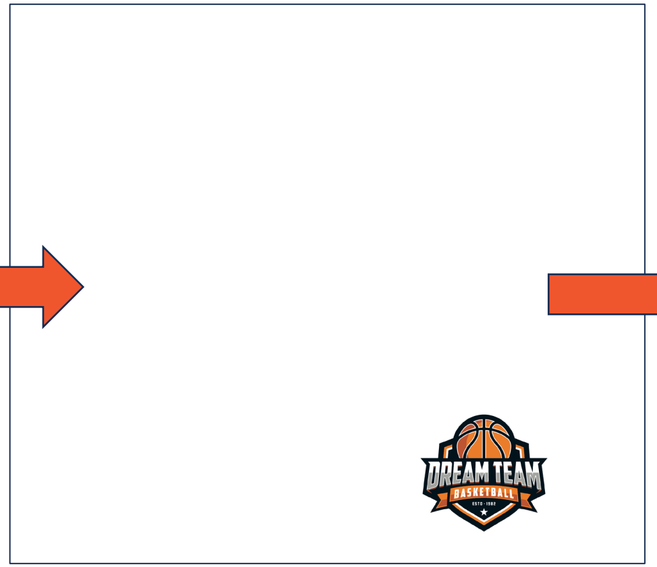
Level Up the 3D Photo Crystal: From Floating Image to Full Scene





ADD SMALL LOGO



FINAL MASTERPIECE!

Advanced UV + Laser Enhancement: Front-Side Insignia Branding

Step 3: On the very front surface, position a small logo in the corner of the layout as a subtle insignia.
Step 4: Print in white + color to maintain visibility without overpowering the main 3D crystal image

Result: A subtle logo insignia that adds brand presence and supports a higher-tier personalization package.

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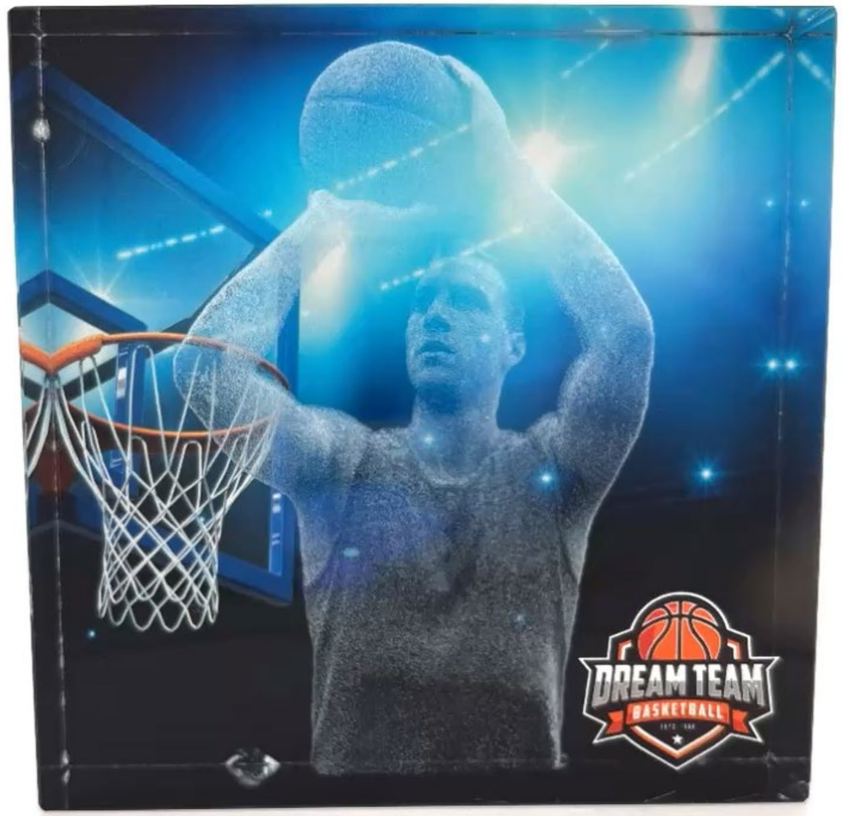
Level Up the 3D Photo Crystal: From Floating Image to Full Scene

Added Value Upgrade:
UV print logo, nameplate, or personalization on the *front face*



Now You've Got:
Internal 3D laser-etched subject
Full-color environmental background
Front-surface branding or personalization

➡️ **Complete visual dimension from every angle**

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Layered Acrylic Awards

→ Depth and color. Upsell: 2-tier engraving + Material Mix







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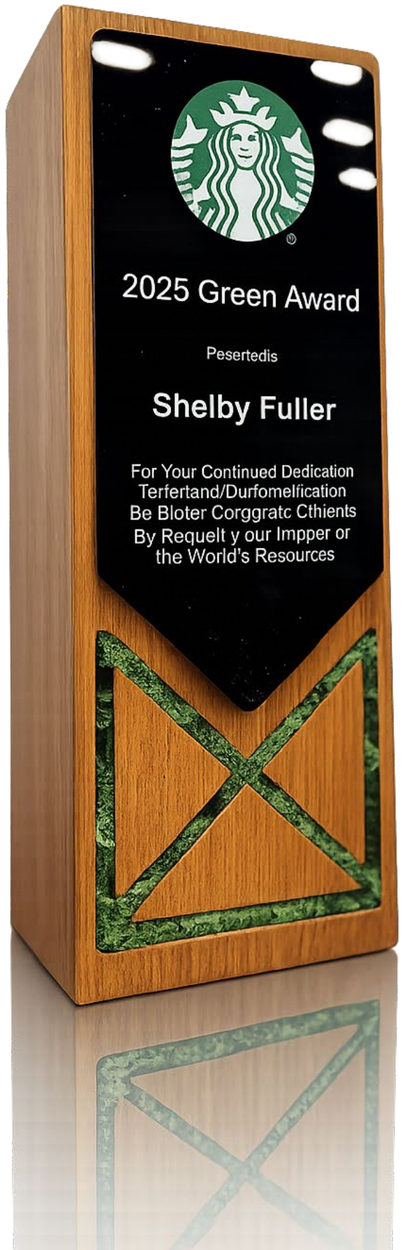

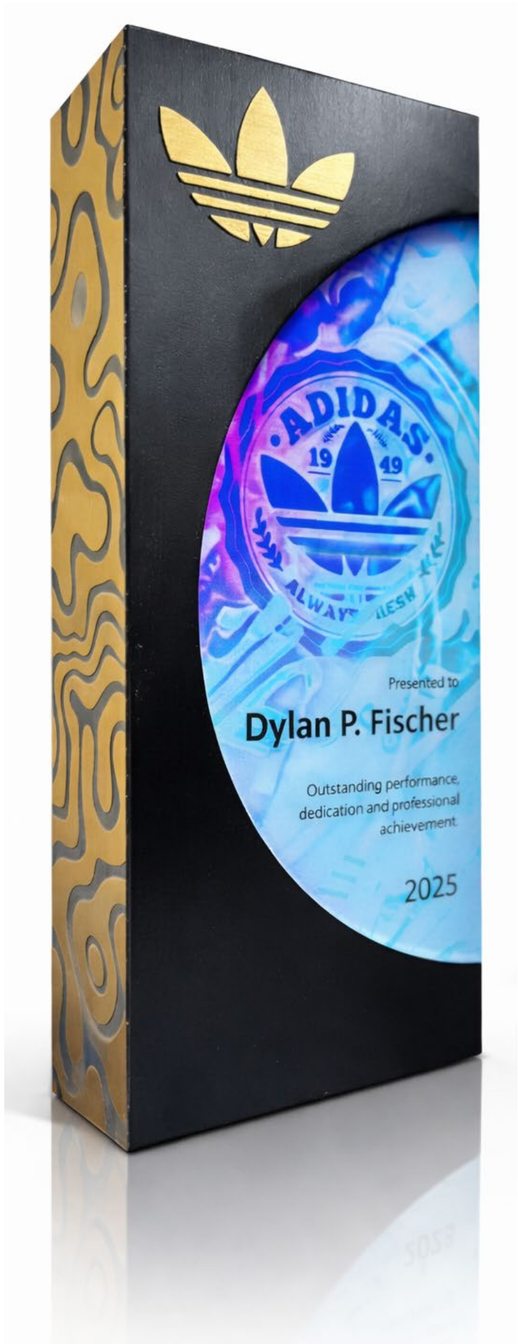

Layered Awards

→ Combine mixed materials with dimensional standoff mounting to create depth, contrast, and a premium floating effect that elevates visual impact.

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UV-Printed, Multi-Layer Acrylic Award — Precision Printing Meets Dimensional Craft





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Layered Acrylic Awards

→ Depth and color.







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Leatherette Hat Patches

→ Premium designs with texture and embroidery finish







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Embroidered Hat Patches

→Finish logo prompt in ChatGPT – USE THIS!

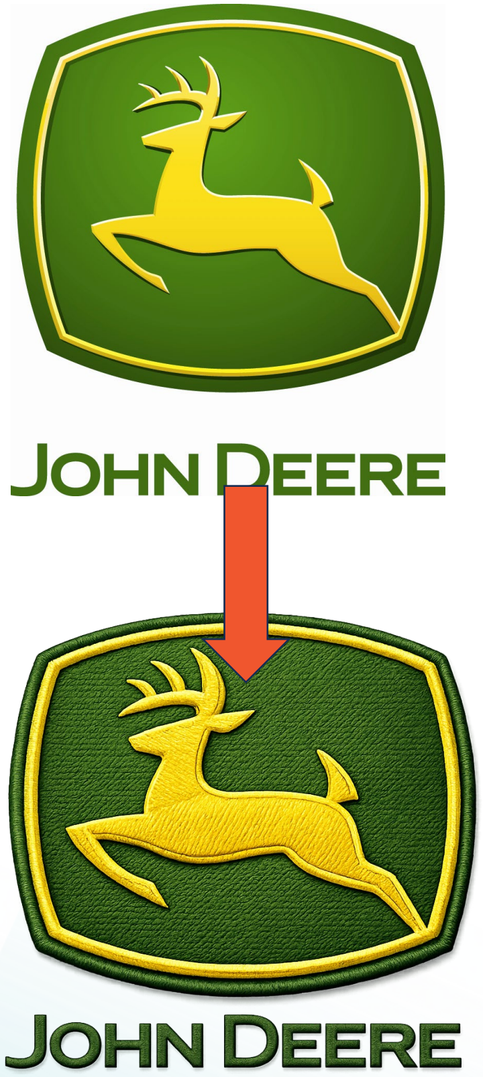
Prompt:

Convert this flat logo into an embroidery-style patch artwork for UV printing.

- Maintain exact logo shape, proportions, and brand colors
- Replace flat fills with stitched thread texture (satin and fill stitch look)
- Add a raised embroidered edge border
- Apply thread direction for depth
- Include fabric patch-style background (twill texture)
- Add subtle shadowing between stitch layers

Final result should:

- Look like a real embroidered patch
- Be crisp and UV-print ready with a transparent background
- Maintain sharp edges and legible text
- Appear slightly raised without a glossy look



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Premium Hat Patches

→ Premium designs with texture and metal like finishes

- Higher perceived value: Gemini Duets – Engravable Plastic – Flexible Brushed Silver 1/16” 2-Ply
- UV print for color, no white background to get more shimmer color finish
- Engrave details on material to expose black and have texture
- Laser cut custom shape

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Patches

→ Add depth and color to workwear







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UV Patch Production Process (Polyester / Nylon Substrate)

1. Start with polyester or nylon patch material (commonly twill or woven performance fabric – Cordura Fabric) with heat-seal or adhesive backing if required

2. Print CMYK + White UV ink directly onto the fabric using a UV flatbed printer- Print CMYK+ W + Varnish ink (LogoJET H2GH inks)

Optional: Add clear gloss layer for texture, durability, or premium finish
Pro Tip: For best quality and detail, use SM (Small-Medium) dot size

3. After printing, load sheet onto laser cutter. Use vector cut path to laser cut the patch to its custom shape outline. Remove excess material (weed) from around patch perimeter

4. Optional: Apply heat-activated adhesive backing for garment application instead of sewing on

5. Final step: Heat press patch onto right chest area of uniform/workwear per temperature/time specs of backing adhesive



This enables full-color, low-minimum, on-demand branded patches for uniforms without embroidery lead times

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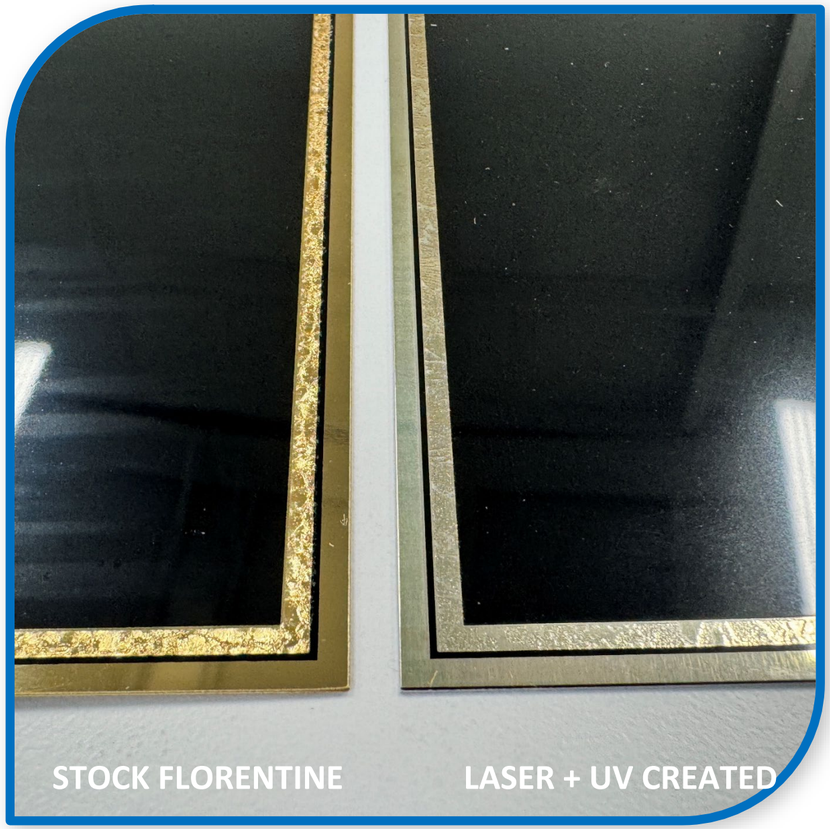
Florentine Black Plaque Plate







- Gemini Duets – Laser XT Engraving Plastic-Black/Gold 1/16” 2-Ply
- Engrave the border to expose the gold
- UV print black border line with clear gloss textures to mimic the antique finish
- Imprint file is “crinkled foil” on Google, then change to black/white

Combining UV Printing and Laser Engraving ART PIECES

- Tactile Enhancements
- Luxury Feel
- Special Effects
- Add wood and iridescent acrylic materials together
- Premium Product





From Flat to Featured: How finishing Techniques Increase Perceived Value

Process Step Added	Added Time *Per Unit	Added Material	Perceived Value
UV Color	+ 30 sec	+ $0.05 ink	Visual branding
+ White Underbase	+ 30 sec	+ $0.08 ink	Color pop on dark media or clear
+ Gloss Varnish	+ 30 sec	+ $0.05	Premium finish/shine
+Laser Cut Shape	+ 1 min	None	Custom form
+Layered Stack	+ 3 mins	+ $1.00	Dimensional Feel
+Textured Varnish	+ 3 mins	+ $0.07	Tactile/Emboss Effect
+ Front Print	+ 30 sec	+ $0.05 ink	Added visual branding
+ Double Print on back side	+ 1 min	+ $0.05 ink	Added visual branding

Examples shown are for illustrative production impact only and do not represent recommended retail pricing.

Techniques to build a scalable workflow solution for your business

In business, you will always face either a sales challenge or a production challenge. Congratulations — you've successfully developed a unique application or identified a market opportunity that solves a sales problem.

Now the real work begins: building an efficient, consistent, and scalable workflow that supports sustainable growth and a strong, profitable business.



Substrates and Materials

- ✓ Purchase in bulk to lower costs
- ✓ Keep inventory on hand for rush orders
- ✓ Plan for material and supplies storage within your workspace
- ✓ Standardize material thicknesses to avoid constant jig or focus changes.
- ✓ Pre-mask materials where possible to reduce handling before laser steps.
- ✓ Choose UV-stable substrates to prevent adhesion or curing issues.
- ✓ Maintain consistent lot sourcing to reduce color or engraving variation.
- ✓ Label material presets by substrate type for faster repeat setup.



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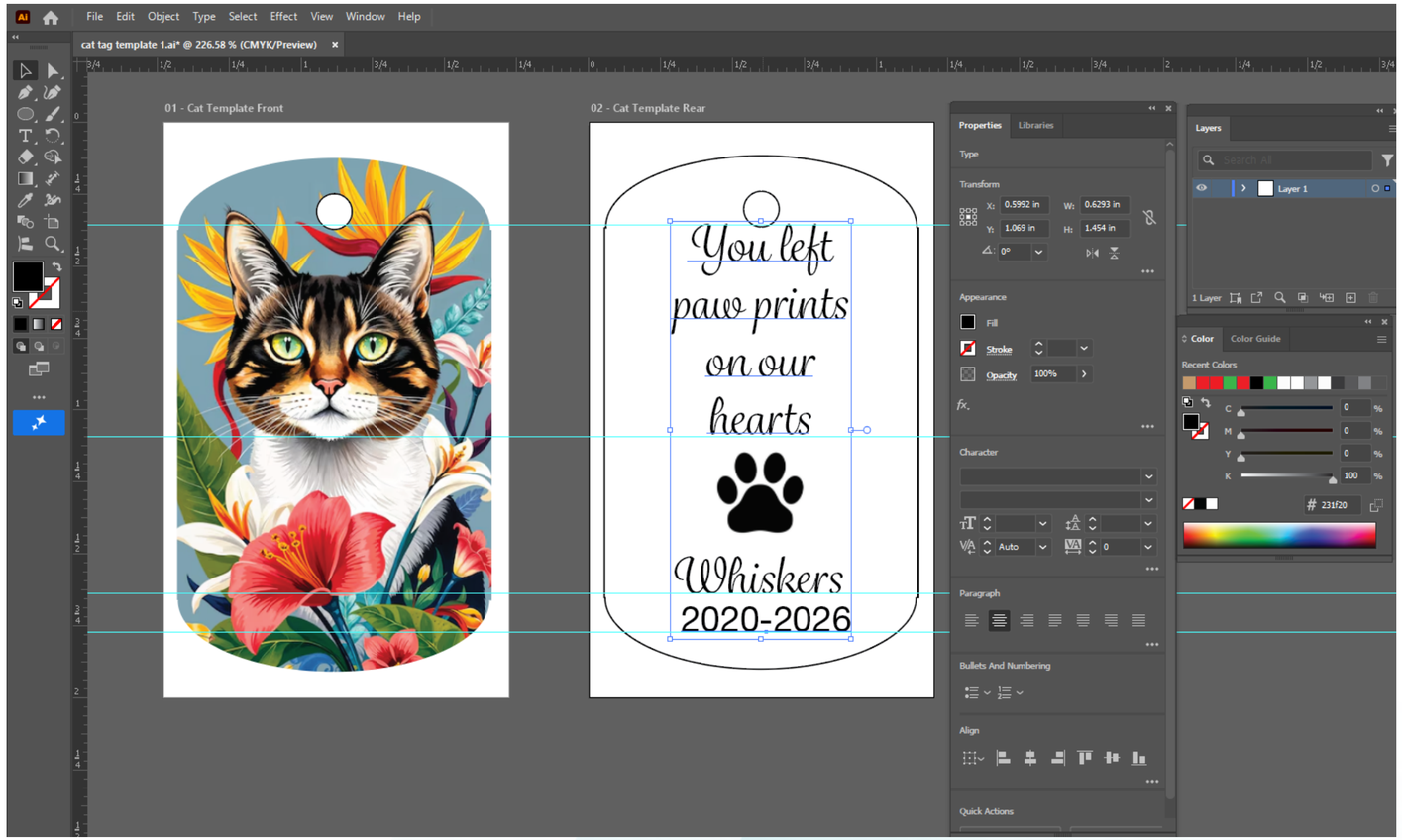
Design Smarter: Create Design Templates

Saved design templates create fast repeatability and cost efficiencies

Once you've created a top-selling design, turn it into a powerful, ready-to-use template. That way, you can quickly swap out graphics, update text, tweak colors, or customize content for repeat orders—without starting from scratch.



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Produce Smarter: Pre-print Popular Items

- Save print time by pre-printing the rear of popular acrylic items such as ornaments
- Die-cut with your laser on demand or pre-cut
- Print customized text and graphics on demand





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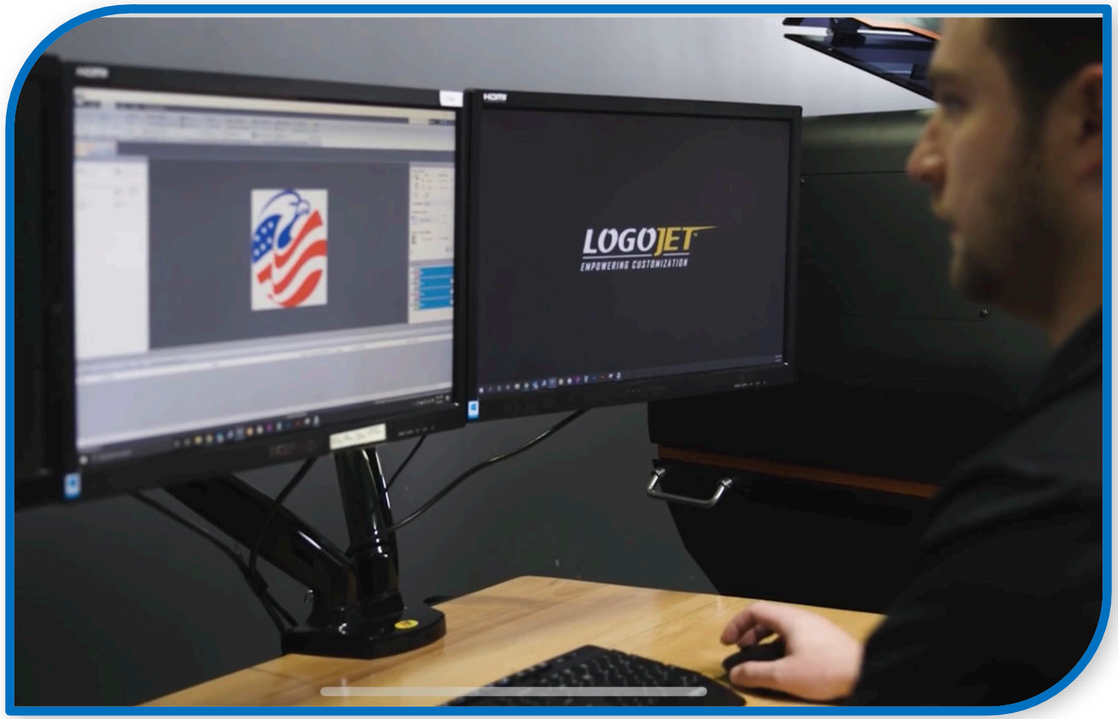
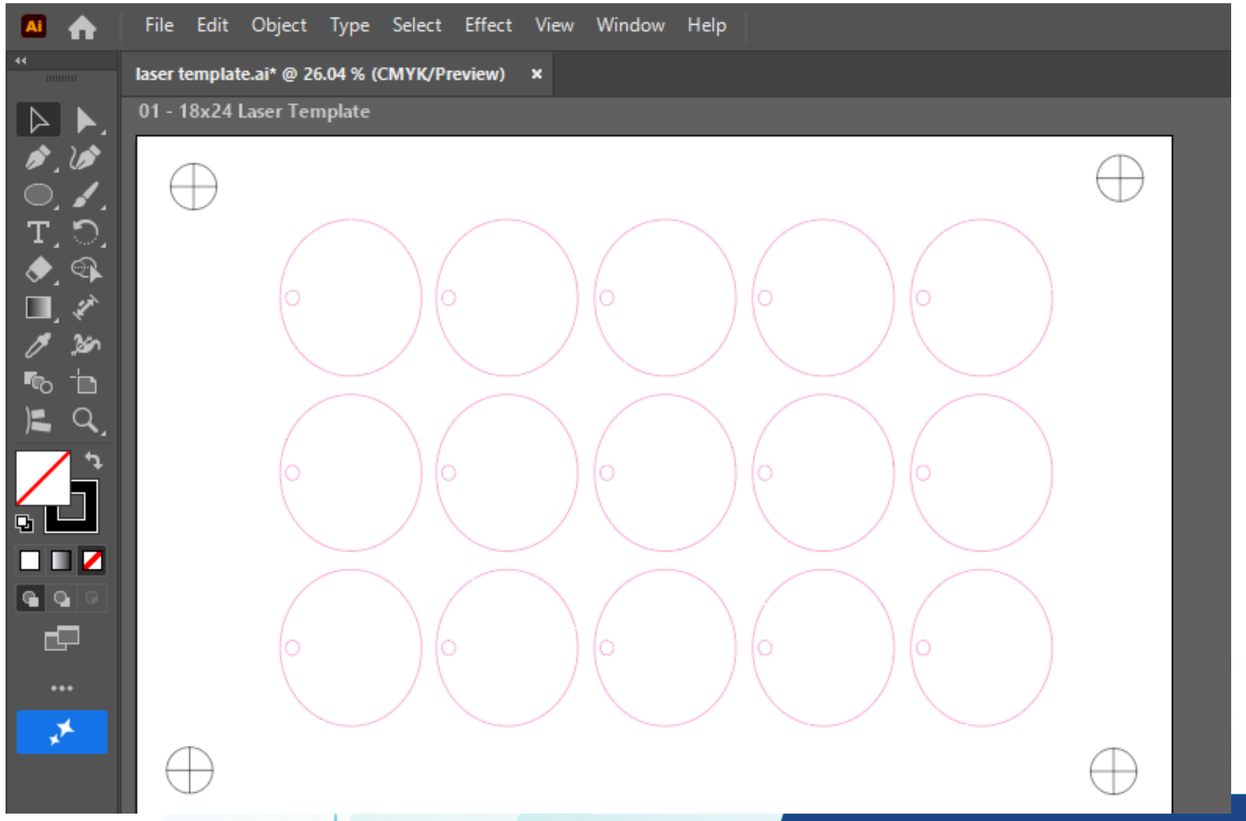
File Setup & Design Considerations



- **Alignment is Key** – Use registration marks or a jig to align prints and engravings perfectly minimizing production delays.
- **Vector vs. Raster Optimization** – Use vector files for precise cuts and raster settings for engraving depth control on images.
- **Layering Techniques** – Design artwork in layers to ensure the laser and UV print interact as planned.
- **Choke & Bleed** – If engraving after printing, slightly extend printed edges (bleed) to ensure no gaps; if printing after engraving, slightly reduce printed areas (choke) to avoid overlapping misalignment.

Advanced Workflow Tips
Design Smarter: Registration, Set up & Speed

- **Prebuild artboards** with universal registration Marks and cutlines.
- **Print layout templates** directly to jig boards.
- **Use UV bed template** for fast manual alignment in short runs.
- **Standardize cut offset** (1mm) to eliminate UV-laser misalign.



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Material Preparation

1. Choose the Right Substrate – Ensure materials are compatible with both UV printing and laser engraving, such as acrylic, wood, coated metals, and anodized aluminum.

2. Surface Cleaning – Wipe down the surface with isopropyl alcohol before printing or engraving to remove dust, oil, and debris.

3. Material Pre-Treatments – Some surfaces may require a primer or adhesion promoter to improve UV ink bonding before engraving.



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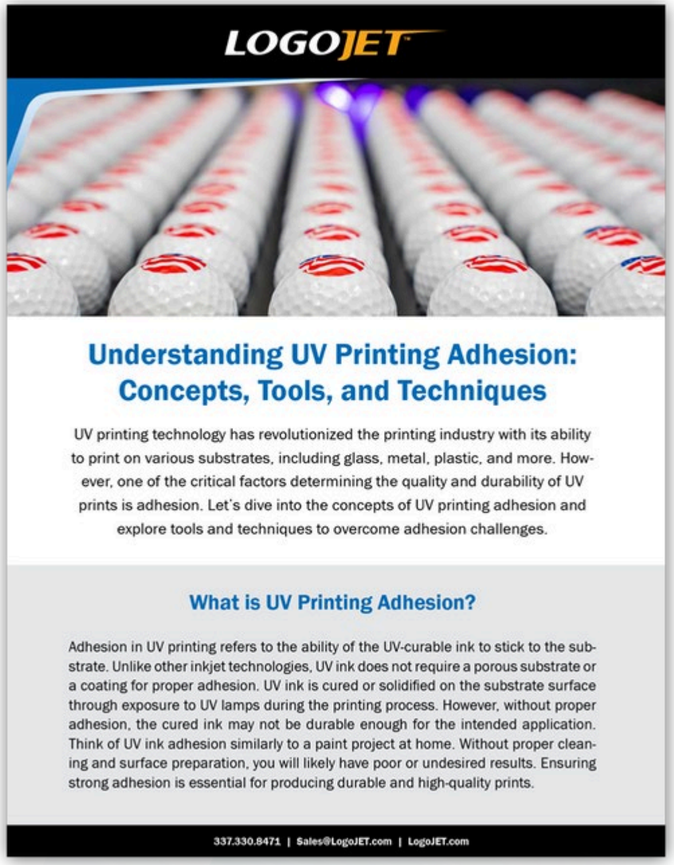
FREE UV Adhesion Guide

In-depth Techniques: Learn about primers, adhesion promoters, and surface treatments to enhance UV ink adhesion.

Practical Tools: Discover essential tools and methods for effective surface preparation and curing.

Expert Tips: Gain insights on overcoming adhesion challenges for different materials like plastics, metals, and glass.

Quality Assurance: Understand the importance of testing and quality control to maintain print durability and consistency.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Understanding UV Printing Adhesion: Concepts, Tools, and Techniques

UV printing technology has revolutionized the printing industry with its ability to print on various substrates, including glass, metal, plastic, and more. However, one of the critical factors determining the quality and durability of UV prints is adhesion. Let's dive into the concepts of UV printing adhesion and explore tools and techniques to overcome adhesion challenges.

What is UV Printing Adhesion?

Adhesion in UV printing refers to the ability of the UV-curable ink to stick to the substrate. Unlike other inkjet technologies, UV ink does not require a porous substrate or a coating for proper adhesion. UV ink is cured or solidified on the substrate surface through exposure to UV lamps during the printing process. However, without proper adhesion, the cured ink may not be durable enough for the intended application. Think of UV ink adhesion similarly to a paint project at home. Without proper cleaning and surface preparation, you will likely have poor or undesired results. Ensuring strong adhesion is essential for producing durable and high-quality prints.

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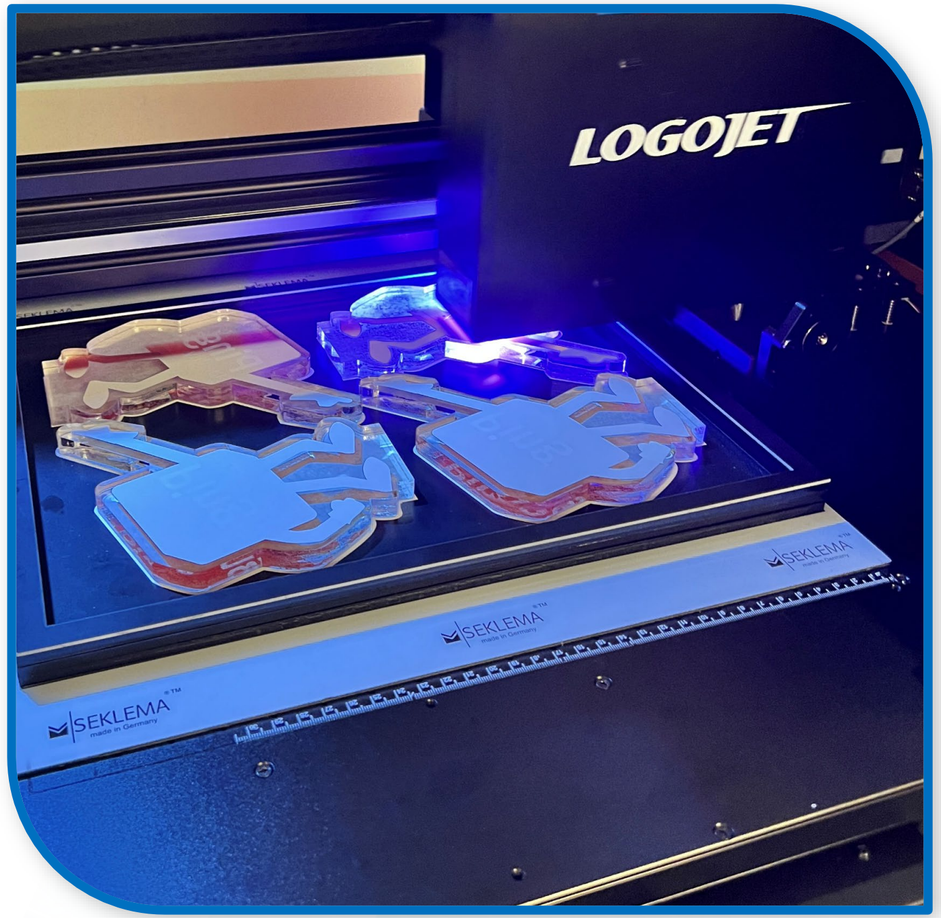
Techniques of UV Printing First, Then Laser



- **Avoid Burning Printed Layers** – Use lower laser power to prevent burning the UV ink, especially on coated surfaces.
- **High-Opacity White Ink** – For strong contrast, apply a solid white ink base layer before printing color on transparent or dark materials.
- **Design Padding Between UV and Cut Lines** – Ensure UV-printed graphics do not overlap with the laser cut line by adding a small padding or offset. This prevents the laser from cutting into the ink, reducing the risk of flaking or damage due to the beam's intensity.

Techniques of Laser Engraving First, Then UV Printing



- **Deep Engraving for Better Print Adhesion** – A recessed engraving creates a pocket for UV ink, making it more durable.
- **Control Overburn & Charring** – Minimize laser power to reduce burnt edges that can interfere with ink adhesion.
- Avoid warped materials
- In some cases, assess speed of decoration, in some cases UV printing can be faster to produce depending on the material/setting – *Refer to example next slide*

Workflow & Production Efficiency – Continued

UV and laser technologies work well together, but one can sometimes be faster or more efficient than the other.



Wood Piece:
Laser cutting was used, but UV printing was faster than etching, avoiding laser bleed on wood.

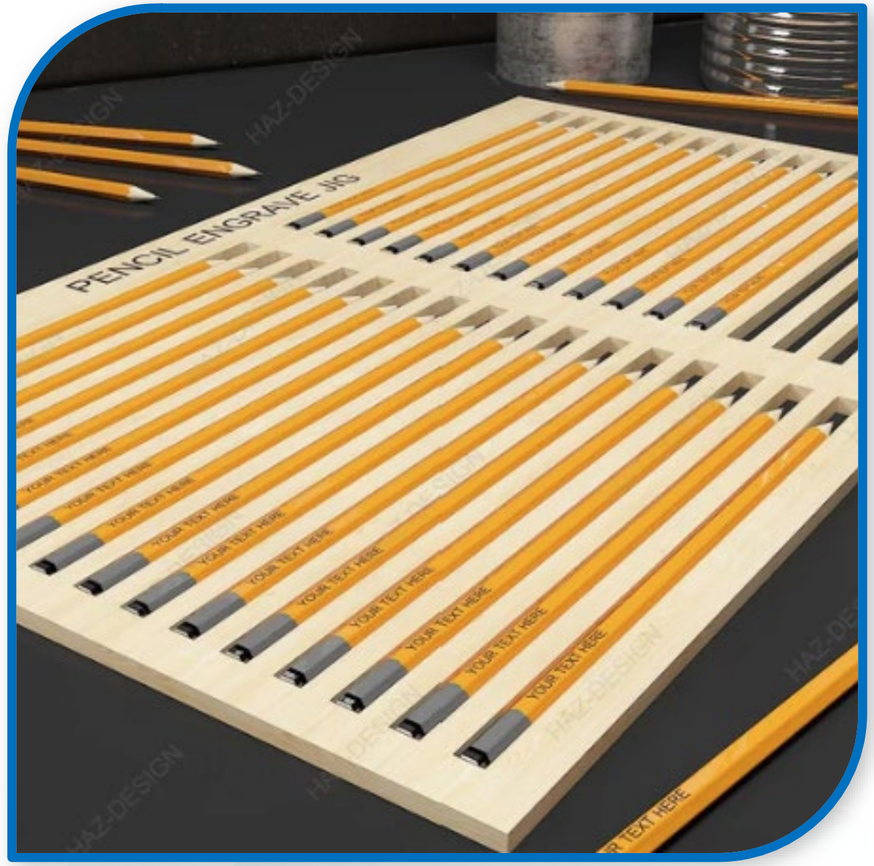


Diploma Marking:
While laser engraving with Cermark worked, UV printing was faster and more efficient.

Custom Jigs: Mass Repeatability

- Create on dark or solid materials (Acrylic, MDF, ABS, HDPE)
- Include bed registration pins for alignment
- Cut through or adhere a bottom base for product transfer





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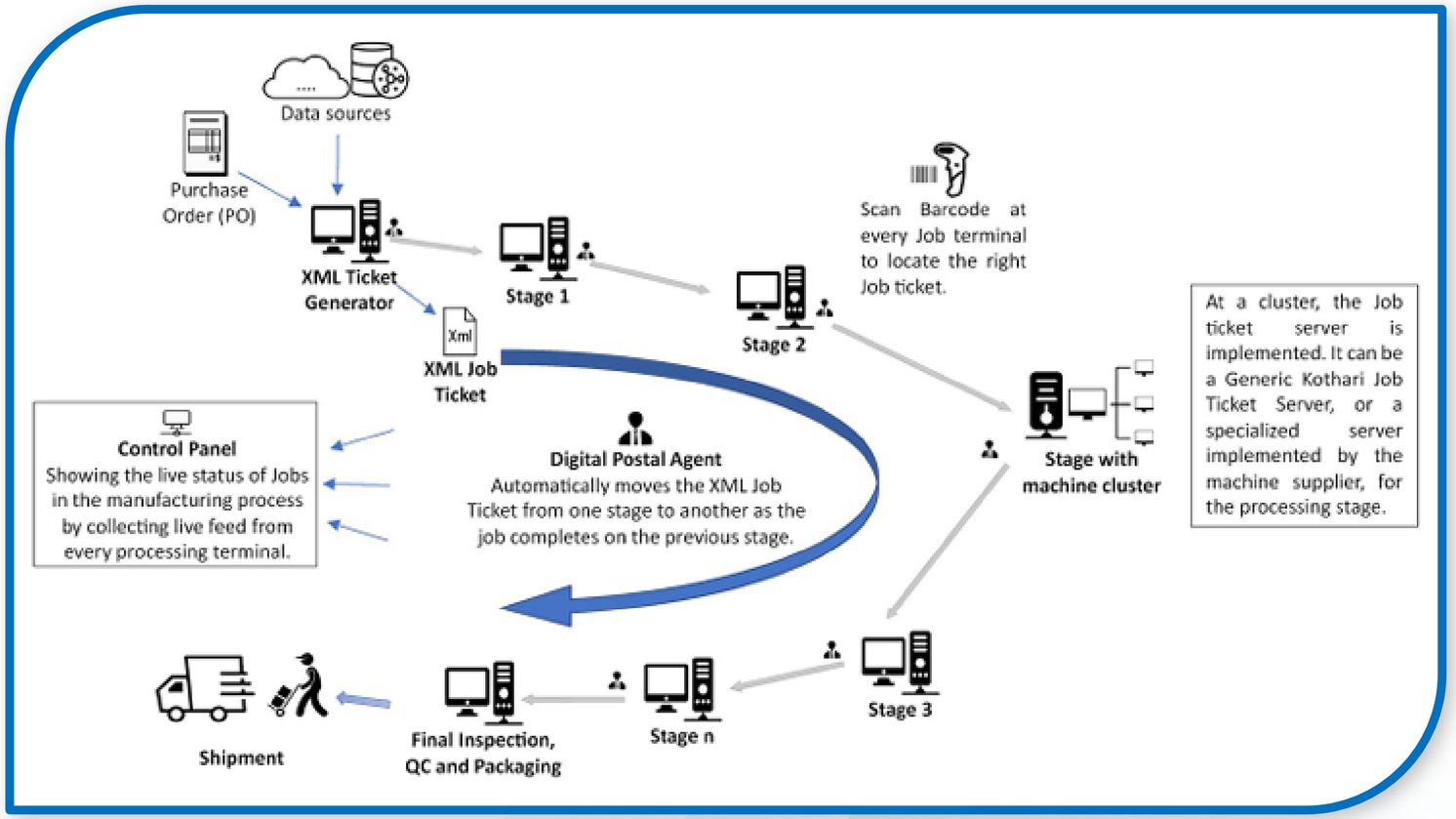
Create Workflow Integration and Automations

There are many popular software packages which will create integration from your website, to production, and all the way to the final packaging.

Workflow automation enables high-volume production while minimizing labor involvement and reducing the risk of human error.



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Workflow Automation Video Demo



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Business Use Case: High-Volume Production with UV + Laser

- Laser cut custom jigs in-house for repeatable product placement
- Assigned a unique barcode to each tray. Linked tray barcode to the correct print file and layout
- Enabled print merge for batch personalization
- Integrated workflow into ERP system for automated job routing
- Automation allows order entry and production pre-press 24/7 so jobs are queued for the next shift
- Production includes 30 machines operated by a team of 5 members
- Processes an average of 200 customized orders per day
- Reduced manual file handling and operator setup time
- Maintains consistency across high-volume production runs

Tray scanning triggers the correct file, layout, and job settings — enabling automated UV print workflows with minimal operator input and scalable output.



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Workflow efficiency Wins - More jobs, Less stress: Duo Workflow Hacks



- ✓ Run UV while the laser cuts the next batch to keep both machines active.
- ✓ Use laser-cut jig systems to ensure repeatable placement in bulk runs.
- ✓ For short runs, print the layout directly on the LogoJET bed for quick alignment.
- ✓ Print subtle textures on the bed as placement guides for repeatable product setup.
- ✓ Split workflow into design, print, and cut stations for continuous production flow.
- ✓ Apply a protective mask layer to preserve UV-printed areas during engraving.
- ✓ Test small before scaling; save proven presets under the product name for repeat orders.

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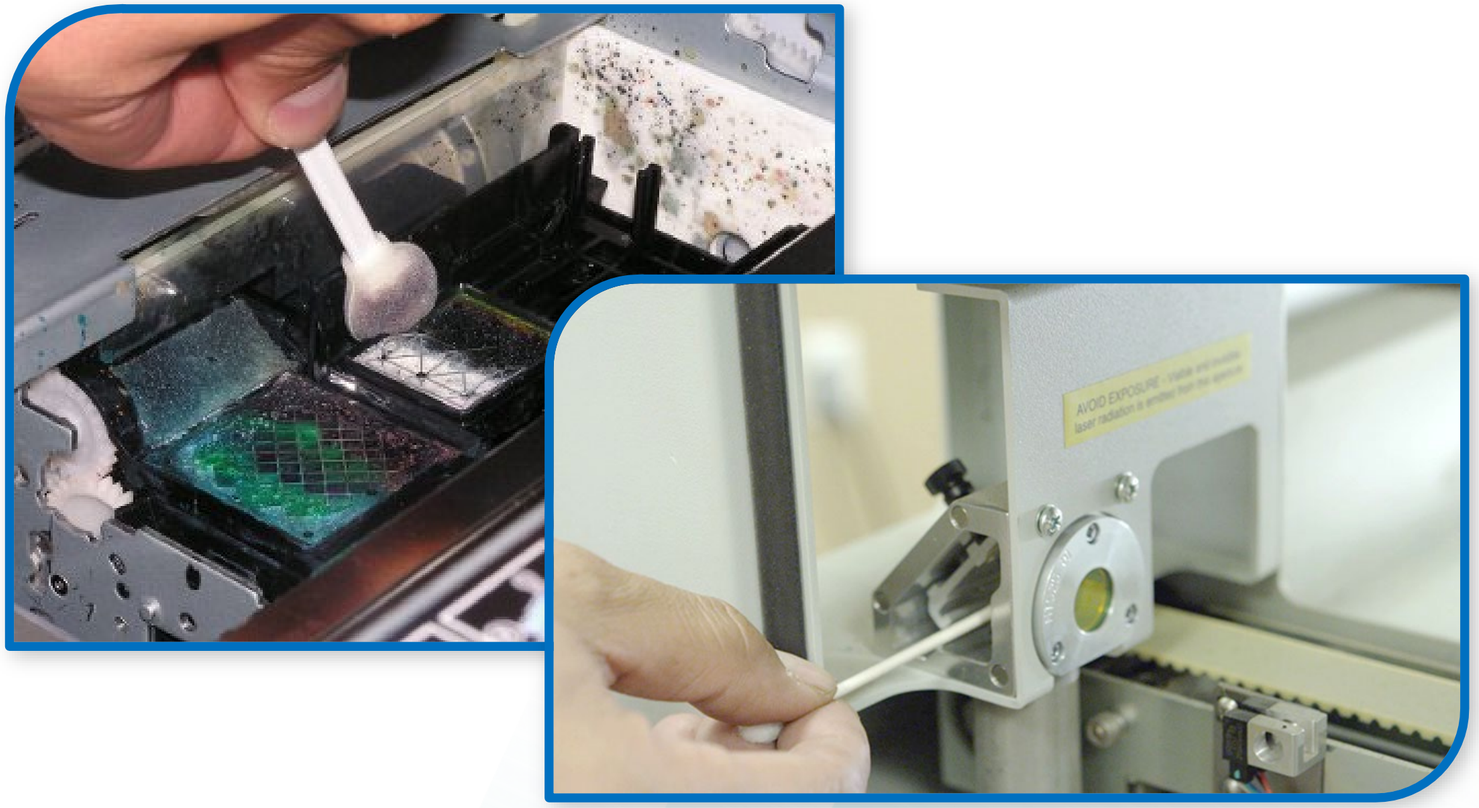
Perform Routine Machinery Maintenance

Your equipment is the lifeline of your business. Perform routine maintenance as recommend by the manufacturer to keep equipment running optimally

Do not wait until there's an issue to perform maintenance or it may create costly production delays



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Turning UV + Laser Into Scalable Production

Techniques That Support Growth Without Increasing Labor

As your shop grows, success isn't about what you *can* produce —
it's about what you can produce **consistently, profitably, and repeatedly**.

UV + Laser enhancements should:

- ✓ reduce setup time
- ✓ allow batching
- ✓ minimize alignment risk
- ✓ support templated workflows
- ✓ enable SKU-based quoting
- ✓ produce consistent results across operators



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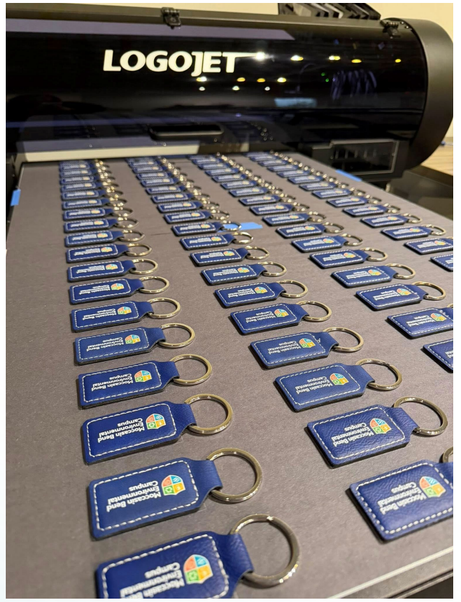
Business Use Case: Scaling with UV + Laser



- 2020 started with a hobby laser in a spare home office
- 2022 moved to a warehouse and grew to 7 laser systems
- 2024 added UV to expand into B2B, wedding, event, and signage markets
- 25% increase in sales within the 1st year of adding UV
- 2025 added a second UV printer to keep up with demand. Today operates a full production space without turning down orders





Laser supports UV with jig creation, print-and-cut workflows, and added finishes —
turning customization into repeatable production.

Apply the workflows in this presentation to scale output without scaling labor — and multiply growth.

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Why You’re Already Equipped to Win

Growth comes from turning creative capabilities into standardized production processes.
When UV + Laser workflows are built for repeatability, embellishments become product lines — not custom jobs.



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Maximizing the Power of UV Printing and Laser Engraving: Advanced Techniques for Personalization Pros

