Digital Trends 2017

Art as Furniture

Dye Sublimation Inkjet on flexible fabric
Dye Sublimation Inkjet on flexible fabric for home and wall décor
Art as Wallpaper
Solvent Inkjet
Canvas Express prints wall décor on EnCore Embossed Canvas foam folded to look like stretched canvas.
Art as Vehicle Wrap
Solvent, UV Curing, or Latex Inkjet
Wrapped bus ad for Copenhagen Zoo
Mural installation 65'x49' digital graphic applied to wall using wheatpaste and course bristle brush on residential building in Berlin.
Thermography – Typographic Method

**Direct Thermal**
Relies on heat to create the letters & images on paper.
- Paper coated to change color
- No ribbon or ink transfer
- Older FAX machines and Sales Registers

**Raised Print Process**
Post print process achieved using traditional printing in a three-step process:
1. Applies plastic resin thermographic embossing powder to substrate.
2. Vacuums excess powder from non-inked areas.
3. Heat-sets at 900F to 1300F.
Thermography
Raised Print Process
Invitations
Letterhead
Business cards
Greetings cards
Digital Umbrella

Electrophotographic

Dry Toner
- Copiers - 8-1/2”x11” thin 20-22# plain paper
- B&W Laser - Monochrome toner
- Color Laser Printers
Are your memories safe?

For more than 150 years, people have recognized the unique value of photography. Imagine how this groundbreaking invention has shaped our lives, giving way to preserving precious memories of the places and events in our world. And while digital technologies have changed the way we capture and record photos, the desire to safeguard our visual heritage today, and in the future, remains essentially the same.

The companies that comprise the International Imaging Industry or I3A understand this all too well. That's why we created this site to help you understand the how to prepare and preserve your photographic memories for years to come.

Quick start

1. Protect your Pictures

If you have all of your digital photos stored on your computer but have yet to do anything else with them, take steps to protect them right away. Make prints, copy to CDs or DVDs, a second hard drive, or upload to an online service for storage.

2. Get Organized

If you use a photo software program or create your own system based on folders and file naming conventions, you need to be organized in a way that lets you find them when you want them. Learn more about the various file naming conventions for consistency, and make sure to create a place or use a method that will help you to locate them easily and quickly.

3. Stay Informed

Watch the industry for technical developments, as well as changes in the digital photo market, to keep up with the latest in technology.

I3A Launches Digital Photo Preservation Website at www.saveyournmemories.org

SaveMyMemories.org

Black-and-White Lives: Inkjet and Photo Solutions
Electrophotographic four color toner copies and heat damage
Digital Umbrella

Electrophotographic

Liquid Toner
Color Digital Presses – Photographs, Book Printing
- HP Indigo
- Mitsubishi
- Ricoh

Offset Electric Digital Press
Heidelberg Press
- Open Edition Prints
- Laminate Sensitivities
- Digital Canvases
Electrophotographic liquid toner – HP Indigo
Digital press toner lifts ink from paper when laminate is lifted to realign
Heidelberg Digital Press – changed color under heat and laminate
Digital Umbrella

Electrostatic

Large-format Plotters
- Bluelines & Maps, Sepias, Diazo Prints
- Ricoh Laser Transfer System
- IBM
Traditional Blueprint

Electrostatic Blueline
Electrostatic Dry Toner Plotter - Blueline
Blueline mounted and laminated with lifters
Digital Umbrella

Thermal Transfer

Dye Transfer

Kiosks
- Sony Picture Station
- Mitsubishi Electric
- Kodak Picture Maker

Minilabs

Dye Sublimation

Portables
- Portraits, Weddings
- Social & Sports events
- On-location imaging

Dye Sub Inkjet
Used for textile printing
- Embed into fabric
- Permanent & washable
Mitsubishi Electric dye sublimation kiosk prints
Cropped and bordered photos are an indicator of thermal transfer kiosks
Dye sublimation technology is common for photos at weddings, sports and special events.
Digital Inkjet

Continuous Flow

Thermal
- Aqueous-dye
- Wide format-pigment
- Solid Ink Phase Change
  - Dye Sublimation

Piezo
- Aqueous-pigment
  - Wide format-pigment
    - Solvent
    - UV-curing
    - UV Gel (Spring 2017)
  - Latex
What is Inkjet?

Inkjet printing is a type of computer printing that creates a digital image by propelling droplets of ink onto paper.

It used to be all about the process: Thermal vs. Piezo.

Current definitions are all about the equipment:

Format - Rollfed vs. Flatbed
Size - Desktop, Wide-format, Grand format
Ink - Aqueous, Solvent/EcoSolvent, UV Curing, Latex, and Dye Sublimation
Fuji EU3081 Acuity Rollfed and Flatbed UV printers
**Printer Size**

- Desktop = up to 11x17”
- Wide Format = 13x19” to 64”
- Grand Format = over 72” wide

Grand-Format building wrap in Philippines
Comparison of Four Basic Inkjet Printers

**Aqueous Ink**
- Has less odor and rich color, for indoor use of poster and fine art.
- The ink penetrates the media during drying, making compatible substrates limited.

**Solvent Ink**
- Dries quickly by heat and evaporation.
- Great for outdoor commercial use as they do not need special coatings, are waterproof, durable and resistant to UV light.

**UV Curable Ink**
- Cures by UV light instantly onto the substrate without the ink seeping into the surface, so they may be used with materials without special preparation.

**Latex Ink**
- Dries by internal radiant heaters with forced airflow to cure and produce dry prints inside the printer.
Inkjet vs. Giclée

All giclées are inkjet, but not all inkjet are giclée.

**Inkjet** refers to small format desktop printing to plain paper from word processing.

**Giclée** is an individually produced, high-resolution, high-fidelity, high-tech reproduction (CMYK) done on special large format pigment ink printers using only high-gamut, moisture-resistant, archival inks.

Iris, Roland, Colorspan, Canon, HP and Epson
Archival Inks

Dye-base Ink
- Excellent color gamut
- Molecularly soluble in its vehicle (water)

Pigment Ink
- Excel in permanence
- Not molecularly soluble
- Embed into receiving layer making them water-resistant
- Less susceptible to destructive environmental elements

Many digital papers have coatings which enhance gamut, making them susceptible to scuffing and scratching which diminishes the archival properties of the print.
Is Solvent Inkjet Giclée Quality?

The biggest question is not giclée or not, but rather will solvent inkjet have long term stability and lightfastness.

In 2015 many publishers use solvent, eco-solvent, UV and latex printers to produce canvases for wall décor.

And dye sublimation may not be far behind.
Digital Inkjet

Continuous Flow
- Aqueous-dye
- Wide format-pigment

Thermal
- Solid Ink Phase Change
- Dye Sublimation

Piezo
- Aqueous-pigment
- Wide format-pigment

Solvent
- UV-curing

Latex
Digital Inkjet

Continuous Flow

Giclée Fine Art Images
Digital, color calibrated, wide-format
Print to Fine art paper, silk, canvas, bamboo, acrylic, aluminum
- IRIS – Scitex
- Epson
- HP Z-series
Continuous flow fine art inkjet
Desktop Inkjet – Dye Ink
- Plain paper, photo paper, light coated paper
  - Canon
  - HP DesignJet
  - Lexmark

Large Format – Pigment Ink
- Canvas, photo, film, polypropylene, Tyvek, textured & coated paper
  - HP DesignJet 4500, 4500, Z series 3100, 6100
  - Canon image PROGRAF iPF series
  - Kodak Encad NovaJet

Wide Format – Latex Ink
- HP DesignJet 25500
Thermal Wide-format Canon image PROGRAF paper and canvas
Thermal inkjet photo printer papers - clockwise
HP Matte Litho-realistic Paper (HP Z3100); HP Hahnemühle Smooth Fine Art Paper on Z2100; HP Professional Satin Photo Paper and HP Collector Satin Canvas on Z3100
Digital Umbrella

Inkjet

Continuous Flow

Drop-on-Demand

Thermal

Piezo

Desktop – Pigment Ink

Also called piezoelectric and micro piezo

Wide Format – Giclée quality

• Epson Stylus Pro 9880 – fine art paper and photos
• Roland

Wide Format - Commercial Use

• Epson Stylus Pro 9900
• Mutoh Falcon II
• Mimaki JV4
Surface sensitivity of Epson desktop inkjet printer on porous paper
<table>
<thead>
<tr>
<th>Printer Type</th>
<th>Heat Tolerant Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Z-series</td>
<td>Heat tolerant</td>
</tr>
<tr>
<td>Epson Wide-format</td>
<td>Heat tolerant</td>
</tr>
<tr>
<td>Heidelberg Press</td>
<td>NOT heat tolerant</td>
</tr>
</tbody>
</table>
Wide Format Solvent Inkjet

Eco-solvent inks = waterproof, durable and resistant to UV

Digitally printed canvases

For commercial use and signage

Interior and exterior with no special coatings

- Epson Stylus Pro GS6000, Epson SureColor S70
- Roland VersaCAMM
- HP Scitex LX600 (formerly HP DesignJet L65500)
- Mutoh ValueJet
Roland VersaCAMM solvent inkjet 56” wide format
Photo
Surface Scuffing
Mounted plaques on Railroad Museum Timeline
Café wall solvent on MDF

Banners

Océ Arizona solvent on mesh
Digital Umbrella

UV-Curing Inkjet

- high-intensity UV light instantly cures ink, coating, adhesive
- scratch resistant
- environmentally friendly
- for glass, acrylic, corrugated foam, polycarbonate & ACM
- for automotive, electronics, telecommunications, graphic arts, and converting
- for use on metal, glass and plastic

UV-Curing Inkjet

- Agfa,
- Durst,
- HP Scitex models,
- Mimaki, Mutoh
Printing to flexible media as Product labels, window décor, vehicle wraps...
Digital Umbrella

Latex Inkjet
- aqueous pigment in ink
- prints to uncoated media
- internal radiant heaters
- forced airflow to cure
- lightfast
- ready-to-use
- for flexible signage (Tyvek)
- indoor and outdoor
- scratch, smudge resistant
- water resistant

Wide Format Latex Ink
- HP DesignJet L25500, L26500
- HP Scitex LX6001
- HP Scitex LX800 Printers
- Mimaki JV400-130LX
- Mimaki JV400-160LX
Vinyl Banners and Ink

• True Solvent Inks
  • King of banner inks
  • Solvents bite deeply into the vinyl and provide a strong, durable bond.
  • No further laminating or coating is needed.

• Eco-Solvent and Low-Solvent Inks
  • Don't bond to vinyl media as well as true solvents.
  • Good color and durability with lower levels of VOCs.

• Latex Inks
  • Pigmented, water-based inks using aqueous-dispersed polymer
  • HP claims overall durability that outperforms eco-solvent ink.
  • Mimaki has recently introduced its own latex printing systems.

• UV-Cure Inks
  • Sit on top of vinyl and use an adhesive to stick to the banner.

• Aqueous Inks
  • Water-based inks cannot print directly onto vinyl banners.
  • Coated banner media is more expensive than uncoated media.
Lightbox, wall décor…
Osmond Sign – Latex Print
Digital Umbrella

Dye Sublimation Inkjet
- direct printing process
- replacing screen printing
- for polyester textiles
- permanent and washable
- requires heat setting

Direct Printing
- uses compatible dye inks
- for silk, cotton, wool
- requires pre-treatment, washing and post-treatment

Wide Format Printers (24-64”)
- Epson SureColor
- Mimaki DS series
- Mutoh ValueJet

Grand Format Printers (>72”)
- Agfa Graphics 126”
- Printer Evolution 126”

Giclée
Grand Format Dye Sublimation
Printing on cotton and polyester-based fabrics with Pigment-based dye sublimation and direct-disperse inks is growing in wall decor.
Dye Sublimation on Metal Plate

*Sentry West, 24" x 48"
Anita Jesse, artist

Dye Sublimation on Canvas

*Solitude, 24" x 24"
Anita Jesse, artist
Dye Sublimation, 2017

History
• In 1957 French textile company discovered sublimation
• Under high temperature, dyes go to gaseous phase, never liquid.
• Late 60s it was used in early computer printers.
• Dye-sublimation printing is dominantly used for textile printing.
• Rivals UV for printing on 3D objects like mugs, phone covers…

Transfer Process
• A dye-sublimation ink consists of a solid pigment or dye as liquid.
• An image is printed onto a transfer paper.
• Paper then contacts a polyester fabric using heat and pressure.
• Solid dye sublimes into the fabric, solidifying onto the fibers.
• The image physically becomes part of the substrate.
• Allows for more detail, sharper edges and vivid colors.
• For graphics, high-end fashion, sports apparel, interior design, promotional products, interior signage

Current direct dye-sublimation
• Prints directly onto a fabric without a transfer sheet.
• Deeper dye penetration limits detail and color.
PPFA PRINT 2017-18

*Sun Dappled II*

Created by Wild Apple Studio
Published by Wild Apple Graphics

- 6x6” Metal plate
- High gloss finish on Chromalux
- Epson dye sublimation printer
- Dye inks transfer image to paper
- Applied to the Chromalux panel
- Treated to receive the dyes
- Put flat into a heat press @ 400F
- 80 psi for 2 minutes
- Printed by Northwest Art + Frame
- Available at PPFA bookstore,
  PFM bookstore and online
2015 New York Fashion Week
*Digital Coutour Event*

- Dye-Sublimation Inkjet
- Epson offered SureColor F-series
- 11 designers for their collections
- Leonor Silva, ESOSA, and Maggie Barry
Printer Evolution Evo126DS
Epson SureColor F7170
Mutoh ValueJet
Digital Umbrella

Inkjet

Drop-on-Demand

Solid Ink

Solid Ink/Phase Change Inkjet

• Tektronix
• Xerox Phaser Series

Solid Ink

• wax based inks
• can feel the edges
• 150F + will melt inks
• inks may soak through
• release paper will
  to new projects
• commercial applications
Solid Ink – Phase Change Inkjet
Note faint image transfer on release paper
Solid Ink

Even 150F temp, short duration HA board will melt inks and soak through.
Solid Ink – Phase Change Inkjet
Major image melt and transfer from transparency to release paper
Digital Printed Canvas
Heidelberg Digital Press – liquid toner on canvas (L) Inkjet (R)
Wide format inkjet (L) does not flake, digital press toner (R)
Epson 7800 Piezo Inkjet on Magiclée Cotton Matte Canvas for pigment ink; Poly/Cotton Canvas for dye/pigment; and Poly/Cotton Matte Canvas for pigment
Start of Test 2006

Why do they sag?

Faded by 2011
Shear strength may be fine for some mounts, but not all.

Test for digital canvas adhesives PS, HA and film,

PFM article June 2006
Canvas Test 2014
In search of tear strength
Better bond, but not aggressive enough for true tear strength.

Tear strength should be aggressive enough to rip the surface paper or mount when pulled.
## HA Board - Fabric and Printed Digital Canvas Comparisons

This chart was developed specifically to compare standard industry HA boards including MountCor, Kool Tack, Speedmount, Single Step, Fome-Cor, HartMount, Omega HAM and Coda. Pressure-Sensitive boards as listed and common heat activated roll adhesives.

<table>
<thead>
<tr>
<th>Board Info</th>
<th>Digital Canvases</th>
<th>Types of Art</th>
<th>Board Info</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Heat Activated (HA) Boards</strong></td>
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<tr>
<td>3A Fome-Cor Heat Activated</td>
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<tr>
<td>Bainbridge Artcare Restore</td>
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<tr>
<td>SpeedMount</td>
<td>x</td>
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<tr>
<td>Heat Activated Foam-HAF</td>
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<tr>
<td>Encore Single Step</td>
<td>x</td>
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<tr>
<td>Gilman InSite Heat-Activated Foamboard</td>
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<tr>
<td>MountCor</td>
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<tr>
<td>MountCor Canvas</td>
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<tr>
<td>Hartman HartMount</td>
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<tr>
<td>Kool Tack Preserve</td>
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<tr>
<td>Preserve Ultra</td>
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<tr>
<td>100% Reversible Acid Free FB</td>
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<tr>
<td>Drymount Foamboard Archival</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Drymount Foamboard - white</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>E2-High density, fabric board</td>
<td>x</td>
<td>x</td>
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<tr>
<td>3X Mounting Board</td>
<td>x</td>
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<tr>
<td>Omega/M&amp;M Heat Activated Mount (HAM)</td>
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<tr>
<td><strong>Adhesives</strong></td>
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<tr>
<td>HA Films = Fusion, Flobond...</td>
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<tr>
<td>HA Digital Tissues = RagMount, GigleMount...</td>
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<tr>
<td>P-S Film = Gudy 871, PMA, PerfectMount</td>
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<tr>
<td><strong>Pressure-Sensitive Boards</strong></td>
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<tr>
<td>3A Fome-Cor Self Adhesive</td>
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<tr>
<td>Coda-Foam 1/4&quot; and PVC</td>
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<tr>
<td>Gatorfoam</td>
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<tr>
<td>Crescent PerfectMount Foam</td>
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<tr>
<td>Drytac PS Gatorfoam</td>
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<tr>
<td>Foam Board</td>
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<tr>
<td>Elmer’s Quick Stick HT Self Adhesive</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>Gilman High Tack Foam</td>
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<tr>
<td>Hartman HarTac</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Kool Tack InstaMount</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tbody>
</table>

Legend: x = moderate bond; X = good bond; X = excellent bond with tear strength; F = failed when tested; N = do not apply heat; blank = not suitable; PC = poly/cotton; P = polyester; C = Cotton

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Mounting Digital Canvas and Photos

1) Avoid heat and pressure damage.
2) 150°F is too hot for some digitals.

Gilman MountCor

- 130°F lowest temperature available
- 15 seconds mechanical press, 2 minutes hot vacuum
- Safe for ALL digitals, brass rubbings & high melt wax

High Tack P-S with Roller Laminator

- Commercial PS boards or In-house boards
- Drytac, D&K, Coda, Neschen Gudy…
Heat Mounting Comparisons

Dry MHA Tissues or Films Specifically for Digitals
  Bienfang ClearMount, RagMount @ 180°F-190°F
  Drytac GigléeMount

HA Foam Center Boards
  **High Temperature = 180°F**
    Bainbridge HAF, Single Step, NuCor, Hartman
  **Medium Temperature = 150°F-160°F**
    SpeedMount, KoolTack, Gilman InSite
  **Low Temperature = 130°F**
    Gilman MountCor

Reversible Boards = 150°F-160°F
  KoolTack Preserve, Bainbridge Restore
Digital Photo Identification
Endura Metallic Photos - Then and Now

Kodak Professional Endura Color Metallic Paper

- Stable like traditional RC
- May heat mount to 190°F
- RA-4 slightly more surface sensitive
- Discontinued 2009

Kodak Professional Endura Metallic VC Digital Paper

- New Metallic Paper has two dots separating "PAPER", "PAPIER" and "PAPEL"
- Digitally surface sensitive
- Con color shift at 190°F and above
- Mount with P-S or 130°F MountCor
Fuji Pearl Photos

Fuji Crystal Archive Digital Pearl Paper

• Kodak Professional Endura Metallic VC Digital Paper
• Surface Scratches
• Damage with breath
• Transfers substrate surface; Orange Peel
• Acts like Cibachrome
• Commercially printed on Océ LightJet
• Fuji Pearl *is not the same as* FujiFlex
Kodak Endura Paper
Mica in coating appears silver

Endura Metallic

Fuji Pearl RC (R)
Cibachrome vs. FujiFlex

Ilfochrome Classic

- Traditionally comes from slide film
- Current day are digitally produced
- 100% polyester film substrate
- Glass-like surface very susceptible to damage
- Static mount method to maintain image

FujiFlex Crystal Archive Printing Material

- Glass-like surface very susceptible to damage
- 100% polyester film substrate
- Transfers substrate surface
- Static mount image as above
FujiFlex polyester (L), Ilfochrome Classic polyester (R)
High gloss, smooth surface must be maintained.

Prone to scratches and moisture.
FujiFlex glass-like surface calls for static mounting (L)
Even low temp 150°F, short dwell time 15 sec produces orange peel (R)
When in doubt...Go Cold

Cold Mount Materials
Manual PSAs
Low,
Medium,
High tack

Roller Laminators
High tack PSAs
Any substrate

Drytac JM26
Cold Rollers

D&K55

Drytac ML25

CodaMount 44
Pressure control (TTPM) is mandatory.
chris@DesignsInkArt.com
661.821.2188
www.designsinkart.com/library.htm

See you next year!!
Chris A. Paschke, CPF GCF
Designs Ink

www.designsinkart.com/library.htm