The Art of Dye Sublimation

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Who are We?

DIGITAL TECHNOLOGY GROUP

DTG

SYSTEMS > SUPPLIES > SUPPORT

What about you?

- What do you do?
- Do you print sublimation now?
- What's your experience level?

Basic Seminar Outline

- Dye Sublimation Background
- Dye Sub – the Business Side
- Dye Sub Technical Details / Settings
- Dye Sub – ICC Profiles & Color Management
- Demo Dye Sublimation

Dye Sublimation

What does this mean?

- Sublimation is the transition of a solid to a gas without going through a liquid stage.
  - Isn't ink liquid? Yes, but the colorant (dye) is a solid (once dry) and is only “carried” by a liquid “vehicle”.
- Dye Sublimation through inkjet is really dye diffusion due to some liquifying of the dye.
- Not to be confused with ribbon based dye sub photo printers.

Inkjet Sublimation

Chronology

- 1994 - Sawgrass patents sublimation inkjet and surface preparation methods
- 1997 - Sawgrass introduces dye sub ink for desktops
- 1998 – Sawgrass develops sublimation ink for 3rd party wide format printers
- 2003 - 2013+ – Sawgrass licenses inkjet sublimation to 3rd parties
- 2013 – Epson offers complete dye sub solution

Epson Dye Sublimation

Game Changer

- Epson print engine technology
- Epson print head technology
- Epson dye sub ink technology

  - *What all this means: Much higher quality printing with dramatically improved reliability and no "finger-pointing" for warranty issues.*

Business Side of Printing

What products can you offer?

- T-shirts (white, light, or all-over)
- Tradeshow fabric displays
- Textiles – Decor Items
- 1000s of rigid substrates – see Unisub catalog!

Fabric Production

Direct to Garment vs. Dye Sublimation

- Dye Sub – needs polyester surface but more versatile (variety of products), print larger items, more vivid color

- Direct to Garment – print on dark fabrics and natural fabrics (cotton t-shirt)

Core Components of Dye Sub Process - General

- Equipment
  - *Printer, Computer, Heat Press*
- Supplies
  - *Dye Sub Ink, Dye Sub Paper, Blanks*
- Labor
  - *Design, Print, Prep, Press*

Core Components of Dye Sub Process - Specific

- Dye Sub Printer – Epson F570, F6370, 7200, 9470
- Dye Sub Paper – Epson MP, DS Photo, Adhesive, Production
- Computer/RIP – Wasatch Windows based RIP
- Heat Press – GeoKnight Clamshell or Calendar
- Dye Sub Blank – a polyester or polymer coated fabric or rigid surface
- Labor – Detail oriented, can see color accurately

Printer Options

- Epson - “Frankenstein”
- Epson – Genuine – 24” - 64”
- Sawgrass – Desktop to 25”
- HP – 64” - 126 Meter
- Mutoh – 25” - 64”
- Roland – 64”
- Mimaki – 54” - 129”

Printer Options
Epson Specific

- Epson F570 – Brand New 24” - $2,495
- Epson F6370 – 44” - Best Selling Pro Dye Sub printer on the planet - $6,995
- Epson 7200 – 64” - $12,995
- Epson 9470 – 64” Production (2x Speed) - $22,995
- Epson 9470H – 64” Production w/ Fluorescent inks - $26,695

Printer Options
Which Should I buy? Consider...

- Budget – Up Front Cost
- Print Size Requirement – Obvious
- Heat Press Requirement – More Later
- Cost per Print - ink per ML $
- Speed – How fast do you need to print

Printer Options
Ink - Cost per ML

- Sawgrass Desktop - $1.74 - $2.65/ml
- Sawgrass 25” - $.50/ml
- Epson F570 24”-13 cents/ml
- Epson F6370,F7200,F9470 – 10 cents / ml
- Mimaki / Roland / Mutoh Large format – 11-20 cents/ml depending on genuine/3rd party

Printer Options
Paper – Cost per Sq. Ft.

- Sawgrass Desktop Sheets - $.22 /sq. ft
- Epson F570 24” - around $.14 / sq. ft.
- Epson 44” or Larger – around $.11 / sq. ft.

Printer Options
Blanks

- Polyester T-Shirt: $1.50 - $5.00 each
- Chromaluxe Aluminum Panels: $9-$13 / sq. ft. depending on qty/size
- Wood: $14-18 / sq. ft. depending on size
- Production Fabric: $ .50 - $2.00 / sq. ft.

Heat Press Options

- Clamshell – Manual
- Clamshell – Auto
- Calendar – Electric
- Calendar – Drum

Heat Press Prices

- 14x16 – Under $1,000
- 20x25 – Around $3,800
- 26x32 – Around $6,900
- 32x42 – Around $12,000
- 44x64 – Around $19,000
- 55x110 – Around $45,000

Heat Press Considerations

- Extremely Heavy
  - Shipping Costs
  - Receiving Complexity
  - Difficult to “move around”
- Power Requirements
  - 120v or 220v?
  - Single Phase or 3 Phase?

Dye Sublimation

Costs – Complete Solution

- Entry Level Solution – 8.5x11 – 11x17
  - $500-$1500 depending on printer & press
- Production – 24”
  - $3000 - $9000 depending on press
- Production – 44”
  - $10,000 - $28,000 depending on press
- Production – 64”
  - $30,000 - $80,000 depending on printer & press

Dye Sublimation

RIPS – to RIP or Not to RIP

- Print Quality?
- Workgroup/Network Production
- Nesting, Layout, Copies
- Textile Step & Repeat

Dye Sublimation
RIPS – Options

- Standard Print Driver
- Epson Edge
- Wasatch
- EFI, Onyx, Caldera, Flexi, & way more

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Dye Sublimation

Common Blank Options for Art

- Chromaluxe
- Wood
- Decor Rigid Blanks – ceramics, ornaments, puzzles, frames, etc.
- Decor Fabric Blanks – curtains, pillows, clothing, etc.

Dye Sublimation
The Process for Chromaluxe

- Best Results, Use Wasatch RIP
- Use Epson DS Photo Paper or MP
- Use or Build Custom ICC Profile(s)
- Press/Transfer in super clean environment
- Press/Transfer in “Dry” environment

Dye Sublimation
Layers – Order, From Bottom Up

- Nomex Pad
- Tissue or Kraft Paper
- Aluminum
- Printed transfer Paper
- Tissue or Kraft Paper
- Endura Fabric (Moisture Wicking)

Dye Sublimation

Settings – Chromaluxe – Fast Production

- 60-70 PSI
- 400 Degrees Farenheit
- 3” - 11.75” = 1:20
- 12” - 24” = 1:40
- 25” - 30” = 1:50
- 30” - 60” = 2:05

Dye Sublimation

Settings – Chromaluxe – Slow & Low

- 60-70 PSI
- 325 Degrees Farenheit
- 3” - 11.75” = 5:00
- 12” - 24” = 6:00
- 25” - 30” = 7:00
- 30” - 60” = 7:30

Dye Sublimation
The Process for Wood

- Best Results, Use Wasatch RIP
- Use Epson DS Photo Paper or MP
- Use or Build Custom ICC Profile(s)
- Press/Transfer in super clean environment
- Press/Transfer in “Dry” environment
- Pre-Press Wood for 10-15 seconds to remove moisture
- Wrap/Fold paper over back of wood

Dye Sublimation
Settings – Heat Press – Wood

- 50-60 PSI
- 400 Degrees Farenheit
- 3” - 11.75” = 1:35
- 12” - 24” = 2:00
- 25” - 30” = 2:25
- 30” - 60” = 2:55

Dye Sublimation
The Process for Ceramic - Flat

- Best Results, Use Wasatch RIP
- Use Epson DS Photo Paper or MP
- Use or Build Custom ICC Profile(s)
- Press/Transfer in super clean environment
- Press/Transfer in “Dry” environment
- Wrap/Fold paper over back of ceramic to cover edges well

Dye Sublimation
Settings – Heat Press – Ceramic

- 40 PSI
- 400 Degrees Farenheit
- 3-6” Tile: 7-8 Minutes
- 7”-12”: 8-10 Minutes
- Press Opposite – heat through back of tile with paper on the bottom

Dye Sublimation
The Process for Fabric - Clamshell

- Use Epson Adhesive Transfer Paper
- Use or Build Custom ICC Profile(s)
- Press/Transfer in super clean environment
- Press/Transfer in “Dry” environment
- Pre-Press Fabric for 10 Seconds

Dye Sublimation
Settings – Fabric Clamshell

- 60-70 PSI
- 385 Degrees Farenheit
- 45 – 50 Seconds

Dye Sublimation
The Process for Fabric - Calendar

- Use Epson Production or MP Paper
- Use or Build Custom ICC Profile(s)
- Use Take-Up Reel on Printer
- Press/Transfer in super clean environment

Dye Sublimation
Settings – Fabric Calendar

- Every Calendar is a bit different
- Speed & Temperature Should be tested for best results
- Use exhaust / venting system

Dye Sublimation
ICC Profiles?

- What are they?
- What are they for in sublimation?
- Generic vs. Specific vs. Custom Profiles
- Should I create my own?
- What do I need to create my own?

Dye Sublimation
ICC Profiles?

Let's take a look at some profiles!

Dye Sublimation

Dye Sub ICC Profiles – Deeper Dive

- More advanced/specific profiles really require a color managed RIP
- Specific for Textile Swatches/Brand Colors
- Color manage dye sub fleets (more than 1 printer)
- Dye sub printers/prints/blanks tend to drift more than regular inkjet printers – so “re-linierize”.

Demo Dye Sublimation

Epson F570 24" Printer