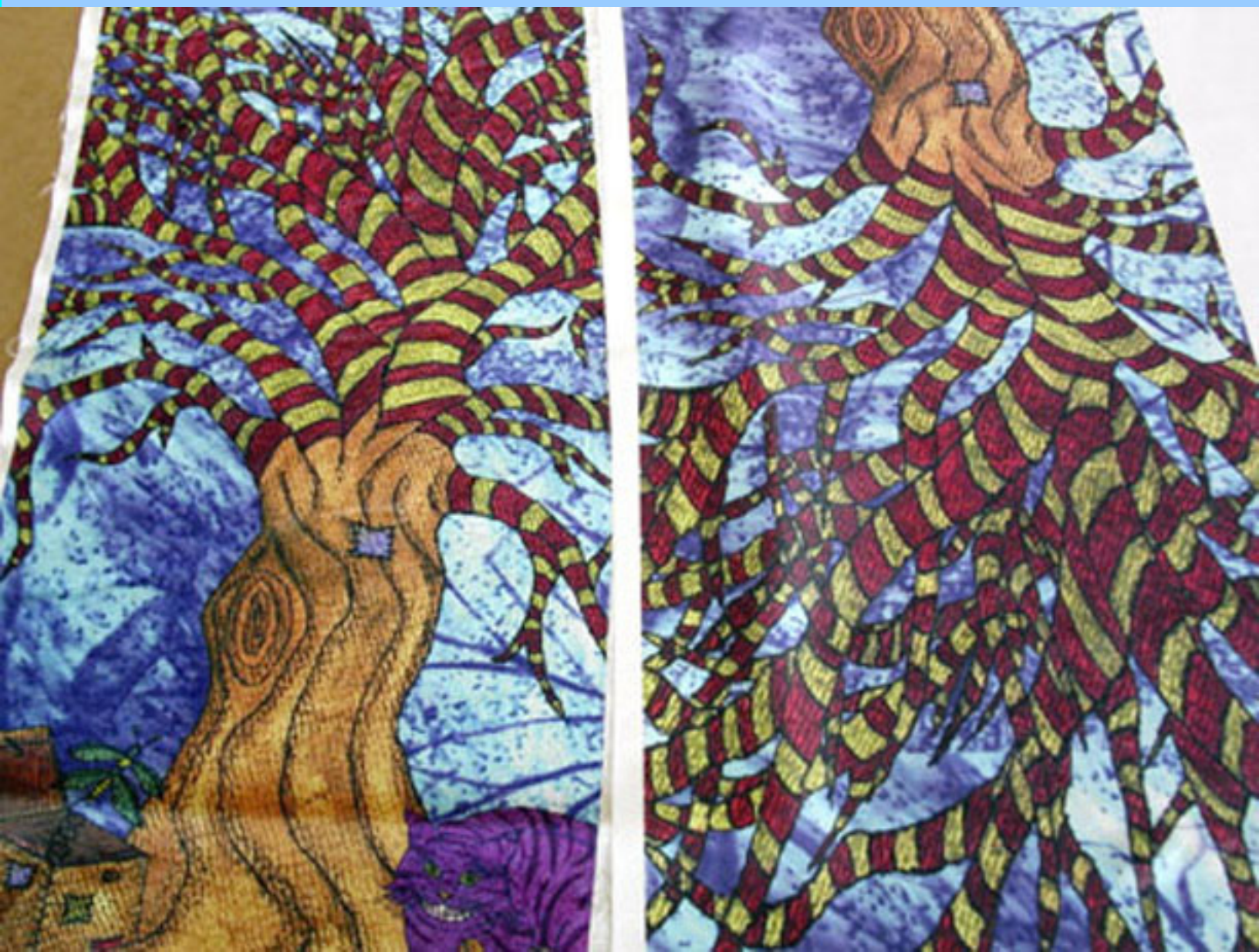
FLAAR Reports

Nicholas Hellmuth

JANUARY 2004

Printing your Photographs on Silk



FLAAR Reports

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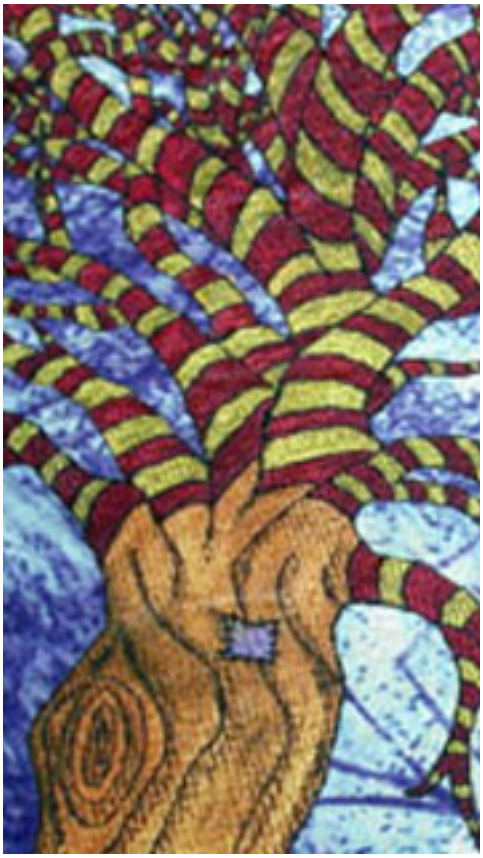


Caption for cover page: Piezo Thernal Print on Silk

Printing your Photographs on Silk

If you have any HP, Canon, Encad, ColorSpan, or Mimaki wide format inkjet printer you can easily print on silk. Even desktop sized printers can print on letter-size silk sheets. The pure silk is backed by peel-off paper, so it feeds easily through your printer as if it were the same as paper.

Actually you can print your photos on metal foil, on cotton, but this particular FLAAR Report by Nicholas Hellmuth reveals how easy it is to print on silk.

In addition to the beauty of seeing your photographs on silk, you can also print on longer pieces of silk to make scarves, ties, blouses, or entire dresses. Printable silk is readily available in sheets and rolls.

Printers for silk

You can use practically any printer, with piezo printheads or thermal printheads. Piezo printheads are in

- Epson
- Mimaki
- Mutoh
- Roland
- And some other brands

Thermal printheads are in

- Canon (uses Canon bubble-jet heads)
- ColorSpan (uses HP thermal heads)
- Encad (uses Lexmark thermal heads)
- HP DesignJet (obviously uses its own HP thermal heads).

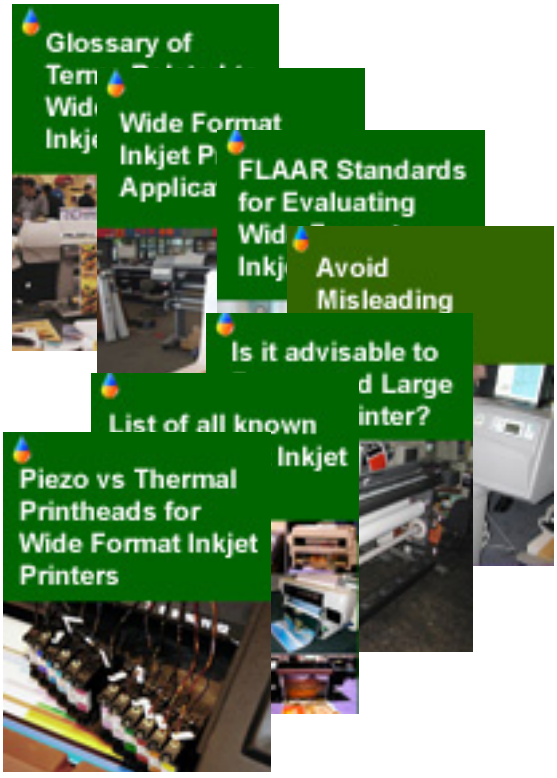
Bubble-jet is Canon's name for its thermal technology (heating ink creates a bubble which forces the ink drop out the nozzle, jetting it onto the material). HP and Lexmark printheads are similar but Canon has a trademark on the word "bubble-jet." The pros and cons of each printhead technology, piezo-electric or thermal bubble-jet, are discussed from all aspects in the FLAAR Reports "Survival" Series.

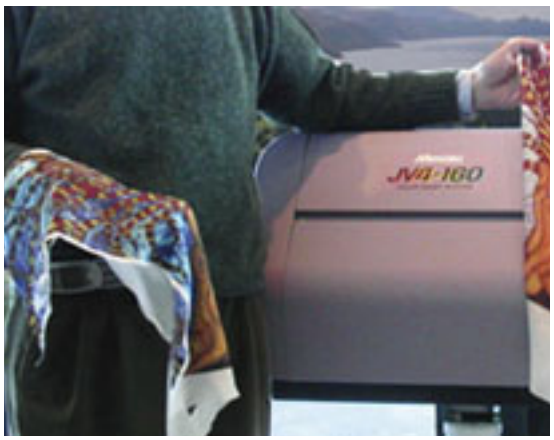
HP, Encad, and Mimaki printers are especially good for printing on silk but we do not know of any reason why the other brands can't work okay with inkjet fabrics. Of the large format models, the HP DesignJet 2000, 2500, 2800, 3000, 3500, 3800, 5000, and 5500 work best. Check with the supplier of the silk as to whether you should use dye or pigmented ink.

We have not tried the HP DesignJet 500, 800, 1050, or 1055 for printing on textiles; the word on the street is that the other models are better.

When you print on top quality photo paper, you need the absolute highest dpi. But when you print onto the rough surface of canvas or watercolor paper, 600 dpi is plenty. The same is true when printing onto silk, cotton,

Survival Series





Silk prints held by Dr. Hellmuth for inspection and evaluation

polyester or any fabric: high dpi is wasted because you can't see the fine detail on the rough woven surface pattern of textiles.

Inks for printing on silk

At least three main kinds of ink are commonly used for printing on fabrics:

- Disperse dye
- Acid dye
- Reactive dye

A pigmented textile ink might be considered a fourth textile ink, but you rarely hear or see a pigmented ink in non-industrial inkjet printers.

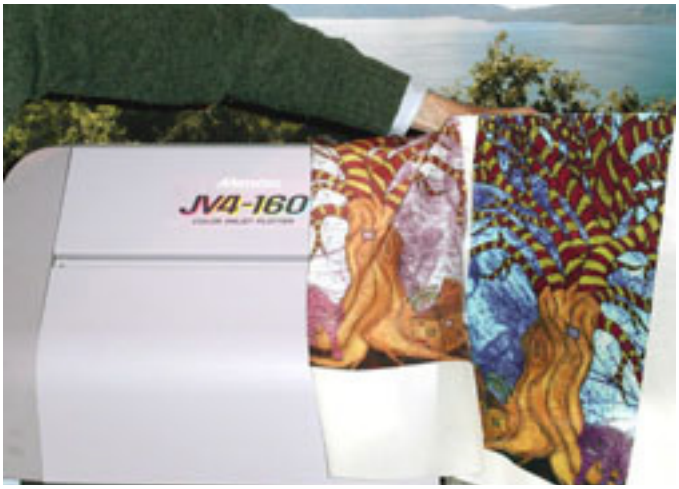
Disperse dye is for dye sublimation heat transfer; you print with disperse dye ink onto transfer paper. You take the paper and heat press the design by sublimation process (the ink turns into a gas and permeates the polyester-treated surface of whatever material you wish to sublimate onto). FLAAR has a separate report on dye sub inkjet process. You can sublimate onto metal, fabric: anything treated with dye sub receptor coating, which is polyester related.

Acid dye is traditionally used for silk, nylon, spandex, and wool. Wool and silk are protein fibers.

Reactive dye ink is used for cotton, rayon, and linen (materials with cellulose fibers).

But in actuality you can use these textile inks for many more surfaces. We used textile inks to print on inkjet posterboard when we did not wish to go to the roughly $1,000 expense of emptying, cleaning, and changing inks in the Mimaki.

Lyson textile inks work in older Encad printers, and can print on silks which are intended for reactive dye ink. Lyson also makes acid dye ink, which is the preferred ink for silk. So why use reactive ink for silk? This way you can use one set of ink (reactive) for cotton and silk both. Otherwise you have to keep one set of acid dye for silk and one set of reactive dye for cotton. This requires having a Mimaki JV4, the only piezo printer that can accept two completely different sets of 6 inks simultaneously. Both the Mimaki and the ColorSpan each have 12 ink lines. All current models of ColorSpan printers can accept two different sets of 6 inks, but it is a thermal printer, not piezo. Most textile inks are for piezo printers, though ColorSpan has a dedicated textile printer, their FabriJet, which accepts both acid and reactive textile inks.[1] It is my understanding that 3P silk can be printed on with reactive dye ink. Of course you can also use regular HP inks too.



Nicholas holding silk printed on the Mimaki JV4

So what counts is what chemicals are coated onto the surface of the silk. All inkjet silk must have an inkjet receptor layer. If you use regular HP or regular Encad or regular Mimaki ink, then you need silk that is pre-conditioned for those specific normal inks. In some cases coatings are specific for thermal printheads or for piezo printheads. The companies that make the media do their best to make it dual-

[1] The ColorSpan FabriJet has been discontinued at least in the USA since sometime in 2003 or possibly late 2002.

platform, but usually the advertising claims “usable for all printers, piezo and thermal” is not accepted by industry specialists. For inkjet paper, you need printer and ink specific media; thus we are assuming that the same is true for inkjet fabrics. Of course inkjet fabrics are a lot more forgiving, since the open weave dulls the color and detail to the point that you might not really notice the difference of whether you are printing with a piezo or a thermal printer.

If the silk you buy happens to be pre-conditioned for reactive ink, then use that. So you need to ask before you buy, and decide, whether you want reactive-silk or the more traditional acid dye ink silk. For home or hobby use you don’t need either: it’s okay to use the regular ink in your basic HP printer to print onto the silk that is sold for these printers.

DuPont has introduced acid dye inkjet inks for printing on silk. The inks are available for both thermal and piezo inkjet printers; the inks come with an optional pretreatment solution. Their press release states that these inks are formulated with the same colorants used for the traditional method of screen printing onto silk. The inks have the ability to be used as process colors or blended offline for specific spot-color printing, and are available in cyan, magenta, yellow, black, orange, green, blue, and a clear dilutent. DuPont can be reached at 302-234-5813, fax: 302-234-5814, www.dupont.com (paraphrased from a PR release).

Photo of the market at Chichicastenango, Guatemala, printed on silk in the FLAAR facility at BGSU

The ColorSpan FabriJet is one of the few production thermal printhead systems that is outfitted with both acid dye and reactive dye inks. You can, in theory, load comparable inks into an HP, but no such inks are available commercially. For Encad DigiFab reportedly has a license to allow using textile inks.

But don’t worry that you have to use specialized textile inks: if you have a basic HP DesignJet printer of the 2000, 3000, or 5000 series, you can print directly onto silk from 3P with the normal inks that are already in your printer. The acid dye or reactive dye inks are only if you want to specialize. If you are an artist, interior decorator, or dedicated enthusiast, then you will eventually wish to experiment with textile inks, steaming, and washing to make the fabrics more color fast. The steaming also causes the colors to pop with extra brilliance.

Summary

You can print on polyester, all kinds of cotton, especially canvas, and even leather. In some cases you need special inks and/or special inkjet printers. FLAAR has all the printers for handling every imaginable kind of fabric. We cover the wider range of inkjet textiles in a separate report, ***Direct Digital Printing on Fabrics with Wide Format Inkjets.*** This FLAAR Report is free when you order any second series (when you have ordered a total of two series you get any two Bonus Reports free).

But if you have any kind of HP printer, either desktop sized or wide format, you can generally print on inkjet silk (has to be paper-backed).

If you print at home with a desktop inkjet printer, try your HP inkjet with some letter size silk sheets. You will need to experiment.

If you have a wide format HP or Encad printer, then you can easily get roll-fed silk from HP, Kodak (Encad), or 3P. 3P fabric tends to be fire-retardant and meets most safety regulations, but check first, since every country is different.

Be sure the fabric you select does not require steaming or washing.

If you wish to do commercial printing on fabrics, that's when you will need to learn about textile inks; you will need to acquire a steamer; and you will have to wash and iron your results.

For further information

If you wish to do commercial production, either direct printing on fabrics, or dye sublimation, then the printer we recommend is the Mimaki JV4 (for paper-backed fabrics) or a dedicated Mimaki textile printer for fabrics that are not paper-backed. You can learn about both from ITNH (Improved Technologies New Hampshire). E-mail Mike Terlizzi mterlizzi@itnh.com.

Please realize ITNH handles only commercial production: this is not the place for home or hobby inkjet printing. We obtained our Mimaki and Iris giclee printer (Ixia) through ITNH.

For home or hobby, try Jacquard. Of course they also do sophisticated production, but they can offer entry level assistance as well, contact Neal@jacquardproducts.com or Matt@jacquardproducts.com

If you have, or wish to acquire, an HP DesignJet to print on silk or other fabrics, the source we recommend is ken@scarabgraphics.com.

The silk (and cotton or other inkjet fabrics) may be obtained from 3P: e-mail info@3P-inktextiles.com. Telephone is (866) 374-5839. If any of this fails to result in hearing back from 3P, let us know at FLAARtest@aol.com.

If you intend to seriously get into commercial production, or if you are a professor at a university and need to know insider details, then you should consider signing up for an IMI seminar on inkjet textiles. Contact imi@imiconf.com or telephone (207) 235-2225.

Bogen Photo imports Legion Photo silk. This is available in letter size, 11 x 17", 13 x 19" sheet sizes, 24" rolls, and 44" rolls. **Phone:** 201-818-9500 and 212-695-8166
Fax: 201-818-9177, or e-mail at info@bogenphoto.com.

Warning

Do not attempt to feed inkjet silk through a laser printer or other kind of printer. First of all, the surface of inkjet silk is specially prepared to receive inkjet inks, not laser toner. Second, the heat of the fuser and other components inside a laser printer are not intended for inkjet materials of any kind. You may totally ruin your laser printer.

FLAAR makes no warranty as to suitability of any inkjet silk for any particular printer because each inkjet coating is unique, and usually intended for either piezo or thermal, or a special kind of ink.

Sources and Resources on the Internet

www.dharmatrading.com/glossary/A.html
An excellent glossary on fabrics.

www.gotheborg.com/glossary/data/silkroad.shtml
Brief definition of the Silk Road.

http://silkery.com/terms.html
Brief glossary of silk (not inkjet silk, but traditional silk).

www.silkzone.com/glossary.htm
Brief description of traditional silk.

www.supersilk.com/glossary.htm
Brief glossary of silk.

www.techexchange.com/thelibrary/inkjet_convergence.html
“Graphics, Fine Arts and Textile Industries Converge on Inkjet Fabrics,” by Teri Ross.