



Previews of FLAAR Report Series

On Inkjet Paper, Media, and Materials for Wide Format Printers



Samples of different inkjet media from Kodak, Photokina 2002 tradeshow

Previews

FLAAR Report series on Inkjet Paper, Media, and Materials for Wide Format printers

This year the joint resource of FLAAR and Bowling Green State University is starting a long range program to systematically document inkjet media. The first step has been totally updating and rewriting of all our reports on inkjet media as well as adding new fascicles: a glossary of inkjet media terms and a comprehensive report on recommended standards for evaluating inkjet media.

FLAAR has gathered experience in inkjet media since 1997, the heyday of the Encad Novajet Pro.

We continued doing testing of inkjet media on the HP 2800cp in our facility in Germany. This was the beginning of our replacing the 300 dpi Encad.

Today FLAAR has two different 72" ColorSpan printers, three Epsoms, six HP DesignJet printers (including two of our favorite model, the 5000ps), a Mimaki JV4, Mimaki textile printer Tx-1600s, and the Ixia version of the Iris 3047 giclee printer was recently installed. Now we are moving into testing and evaluating the Canon imagePROGRAF series of printers.

Thus it would seem fair to say that we have basic experience with inkjet media. However we recognize there is still a substantial learning curve for all of us here at the university. Inkjet media is one component within a complex system. Thus we appreciate the assistance of end users, media coaters, and specialists in RIPs and color management systems for their continued help in providing training for our staff.

Please note: although we do cover solvent ink printers, our reports on media do not yet cover vinyl nor other substrates for solvent inks. We do, however, briefly mention the first generation lite solvents, since most of them actually require coated media. Some of these retrofitted printers verge on "bait and switch." You don't find out until you have paid for them that you can't use the cheaper raw vinyl on some of them. Others of these early "solvent ink" printers turn out to use an oil ink. Welcome to reality.

Our media reports cover media for dye and pigmented inks for Canon, ColorSpan, Encad, Epson, Hewlett-Packard, Mimaki, Mutoh, Roland and comparable water-based inks. HP labels its pigmented inks "UV inks." These are not UV-cured; they are just basic pigmented inks which resist light. Naturally we cover these inks and the media for them.

If you are interested in UV-cured inks, and what they will (or will not) print on, that is covered in the comprehensive FLAAR Series on flatbed printers.

To finance the new program in inkjet media we are creating what is essentially a basic textbook in inkjet media. Each chapter is issued as a separate PDF in Adobe Acrobat format. Income from this book-like series of reports will fund further research at both universities. However we felt it would be helpful for readers to have a brief introduction which would remain free. This introduction is this present preview document.



View of a small portion of the FLAAR facility at BGSU showing several of the ColorSpan and Mimaki printers. FLAAR uses both piezo (Mimaki and Epson) and thermal (Canon, ColorSpan, Encad, and HP) technology, so we can write from experience about the different media piezo requires as compared with thermal printers. Perhaps you might like to share our knowledge.



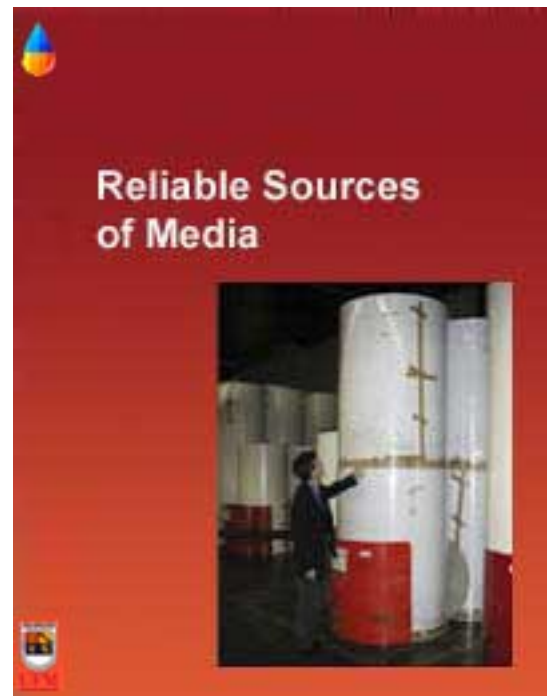
A long-time favorite starts out the FLAAR report series on inkjet media: ***All the different kinds of photo paper, fabric, silk, canvas, vinyl, backlit material, watercolor and artist's paper, even metal that you can easily print onto using a wide format inkjet printer.***

The idea of this report is so that you can locate innovative ways to earn profit with your inkjet printer.

Contents

- Abstract
- Introduction
- Thick and Rigid Material
- Specialty Media
- Inkjet Media Categorized by Application
- Transfer media
 - Comments on of each category of inkjet media
 - Film*
 - Resin coated photo paper*
 - Media for Oil-based Printers*
 - Media for Lite Solvent ink*
 - Waterproof Inkjet Paper*
 - Inkjet receptive coating Layers*
 - Micro-porous media*
- Swellable Polymer Inkjet Media
- The physical and chemical Aspects of Inkjet Media other than Receptor Layer
- General Observations
- Laminates
- Recommended Sources of Reliable Media
- Bibliography
- Sources and Resources on the Internet
- Additional FLAAR Reports on Inkjet Media
- Advisory
- Acknowledgements

Helpful List of Sources of Inkjet Media is a comprehensive source book on where are the paper mills, which companies are coaters, and who resells inkjet media. We annotate this list with pertinent tidbits and tips on where to obtain media that is trustworthy.



Contents

Abstract

The present report

Actual paper mills

Resellers (including manufacturers who sell their own media)

Who are the Big Players?

Multi-product Resellers

Specialty media for dye sublimation transfer

Other Specialty media

Textiles for Inkjet Printers

Documentation

General Background Comments on Media for Large Format Printers

Additional FLAAR Information

Other Observations

Contact Information

Advisory

Media arrives at the FLAAR facility every month from another source, by the truckload. This gives us the experience to provide some tips and help on wide format inkjet media.



All the various Kinds of Inks and Colorants used in Large Format Digital Printers plus Frequently Asked Questions about inkjet inks.

This educational report provides plenty of helpful information about inkjet ink. Mentions powdered toner, liquid toner, wax and resin ribbon colorants, then goes into oil based inks, solvent inks, lite solvent inks, UV curable inks, solid inks (hot melt wax ink), dye sublimation inks, and so on.

Basic, non-technical, brief and to the point. Sort of a beginner's primer in inks and colorants. Thus we explain the difference between "UV ink" and "UV-curable ink." There is absolutely no relationship between the two whatsoever, neither chemically, nor in results, nor in the kinds of printers that use them. Even at inkjet industry conferences the attendees are confused. So it is perfectly natural for you to be confused also.

This is the job of Professor Hellmuth, to assist people from all backgrounds, every level from beginner to seasoned pro, to understand the jargon (hint, he gets confused sometimes too, but he has a staff of 20, and colleagues at the university trained at Rochester Institute of Technology, so he has in-house help). We go to all the tradeshow and attend IMI conferences for the purpose of bringing back tips and help for readers of the FLAAR information network.

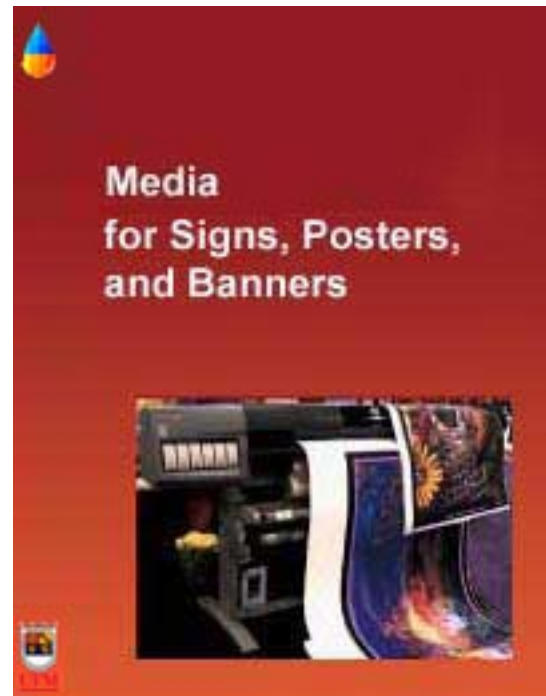
Contents

Abstract
 Should I use aftermarket inks in my large format inkjet printer?
 Toner instead of ink
 Liquid Toner
 Color impregnated ribbons or sheets (resin or wax) instead of ink
 Oil-based inks
 Solvent-based inks
 Lite Solvent inks
 Water Based inks
 What is really in your ink?
 Pigmented water-based inks
 Shelf life of inks
 8-color and variant 6-color inkjets: Light Magenta-Light Cyan vs Green Orange or Red Blue
 Resin-encapsulated pigmented inks
 Epson inks in general
 Inks for Mimaki, Mutoh, Roland, and some Iris Printers
 Canon: no pigmented inks yet available
 Encad and Ilford inks
 Kodak inks
 Learn the reality of pigmented inks
 Learn the problems of dye inks
 Solid inks
 Dye sublimation inks
 Textile inks
 UV curable inks
 Specialty inks
 Continuous ink systems
 Vinyl Cutters
 Pen Plotters
 Gigantagram
 LED: printing with light onto photo-sensitive paper rather than with ink
 White ink
 Ink longevity
 Waterfastness
 Ink usage and over saturation
 Is ink usage deliberately encouraged?
 Ink usage counters on your printer
 Aftermarket inks and voiding your warranty
Will my printer accept aftermarket inks?
Will aftermarket inks clog my print heads?
Will using other inks void my warranty?
 Will such-and-such an ink last longer, or not as long as the manufacturer's ink?
 Sources of inkjet ink
 Inks for Epson printers
Lyson
DuPont
Flint Ink
Formulab
Olympus
 FLAAR's Role in all this
 What's coming from FLAAR in the future
 Further Assistance
 Glossary
 Bibliography
 Sources and resources
 Further Reading
 Advisory

Suggested Inkjet Media for wide format Signs, POP, Posters, and Banners, indoor and outdoor: Inkjet film, vinyl, banner material, etc

Covers media for using with aqueous dye and aqueous pigmented ink on Canon, ColorSpan, Encad, Epson, HP DesignJet, Ilford, Kodak, Mimaki, Mutoh, Oce, Roland, Western Graphtec and other normal wide format printers.

FLAAR prints signs for two universities in order to increase our real-life experience. We often visit sign-shops to gather additional documentation for our reports.



Contents

- Abstract
- Sources of Inkjet Media
- Care and Feeding of your Media
- InkJet Textiles
- Media for thermal inkjet printers
 - Media for HP DesignJet 2000, 2500, 2800, 3000, 3500, 3800*
 - Media for HP DesignJet 5000 and 5000ps*
 - Media for the ColorSpan DisplayMaker XII and Mach 12*
 - Media for Encad NovaJet Printers (including Oce, Ilford, and Kodak)*
- Media for Piezo Printheads
- Printing on silk, cotton, and other fabrics
- Unusual Media, Specialty Media
- Thick media
- Double-sided media
- Special Media for Flatbed Inkjet Printers
- Problems with some media
- Banding
- Some Media contributes to destroying your expensive printheads
- Humidity
- Care and Feeding of your Media
- Back-lit and other transparent media: End-User Reports
- Calculating your media costs
- Inks
- Calculating your Ink Costs
- Miscellaneous
- Laminating your Signs
- Recommended Sources of Reliable Media
- Other Pertinent FLAAR Reports
- References and Resources
- Advisory
- How we determine Which Products to Recommend



Suggested Objective Standards for Evaluation of Inkjet Media for Wide Format Printers.

This report offers some fundamental concepts of how to evaluate media for large format inkjet printers.

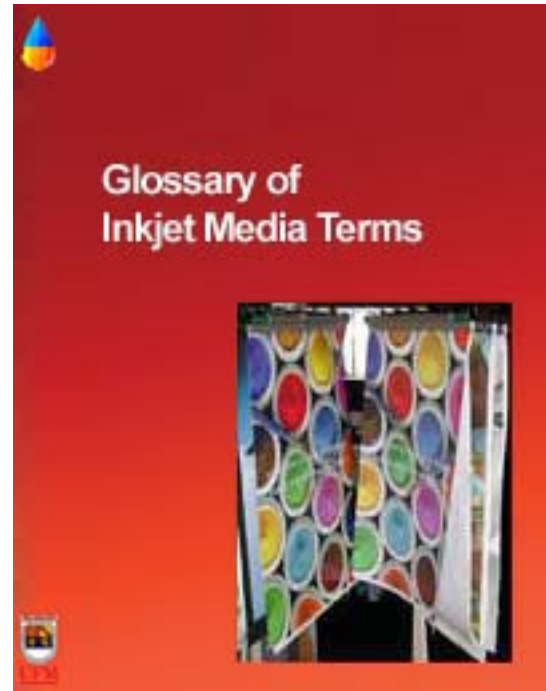
FLAAR has been testing media for its own use since 1997. Last year we decided to test, evaluate, review, and certify for end-users and media manufacturers as well. This testing program is being undertaken in the BGSU lab in the joint BGSU+FLAAR facilities on campus.

Contents

Assessment	Appendix A
Degree of coverage	Summary; What FLAAR prefers to test for
What needs to be tested?	Physical description of the media
International testing standards	Printability of the media
Procedures	Color quality
Specific Tests	Print quality
Physical Description of the Media	Post-printing Handling Issues
Physical Description: the layers of	Suitability (usability, practicality)
the media	Durability
Suggested Applications	Additional considerations
Printer compatibility	Special criteria
Printability, Practicality, Suitability,	Needed new glossary designations
Usability	Suggested Books and Articles
Agfa's tests	Bibliography
Sony's tests	Resources on the Internet
Testing Equipment	Inkjet media companies
Issues	Advisory
Resolution Fade	Acknowledgement
Printing guidelines	
Laminates	
Compatibility of a particular Media	
for Lamination	
Committee for establishing standards	

Glossary of Inkjet Media: Substrates, Printable Materials, Paper and Coated Inkjet Media

Below is the complete list of terms. The first edition covers about 70% of these. All FLAAR Reports are constantly being updated, and the glossaries will constantly be expanded until all these terms are discussed.



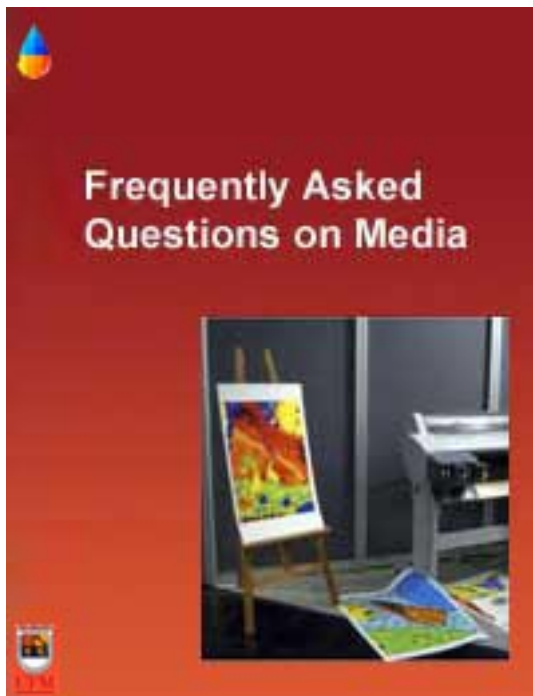
absorption, absorbency	dot gain
accelerated testing	dot quality
adhesion,	dot shape
airborne pollutants	dot size
ANSI IT9.9, standards.	dust and debris
aqueous,	drying time
archival,	dye ink
artificial canvas,	encapsulation,
artist's canvas,	environmental impact factors
banding	fading
bleed,	feathering (wicking)
brighteners	filler
brightness	flocculation,
bronzing,	fluorescing
calendared	folding
cast coated papers	gelatin
coalescence,	gloss
coating company	gradient,
cockle,	grainy, graininess
cold pressed	grayscale
color gamut	hot melt ink
color shift, over first hours, day, week, month	hot pressed
converter (a company that converts material)	humectant
crease	humidity-fastness
curl along edge of the material	incandescent lighting
curl set, see polyester memory	ink,
darkfastness	ink coalescence
Delta E	ink holdout
density, optical density	ink load
dimensional stability	ink paper combinations

ink receptive coating
 ISO-13660
 jaggies,
 laminability
 Lexan,
 lightfastness
 line (sharpness, edge roughness)
 longevity
 lux
 material
 media
 melted wax
 memory,
 microporous
 mordant
 mottle
 mould made paper
 nano-porous
 noticeable fading
 opacity
 optical brighteners
 optical density
 oxidative fade
 ozone fading problems
 paper
 paper-backed:
 penetrant
 penetration,
 permanence
 PET
 phase change ink
 photo quality
 picoliter
 pigmented inks
 plasticizer migration
 polyester
 polyester memory,
 Polymer
 Polyethylene,
 polypropylene
 pooling:
 printability
 removability
 repelling (
 resin-coated paper
 rub off,
 runnability
 scratch resistance
 scrim, as in, vinyl scrim
 shelf life (unprinted)
 show-through
 silica gel,

sizing
 smearing
 smoothness
 solid areas
 solvent, solvent ink
 solid ink
 stability, as in print stability
 stitching
 stretchable
 strike through
 studio canvas
 substrate
 susceptibility
 swellable polymer
 swellable coatings
 tackiness,
 texture
 Tyvek
 usability
 variable droplet
 vellum
 vinyl
 viscosity (ink viscosity)
 volatile emissions
 waterfastness
 wicking (feathering),
 years before noticeable fading



Media arriving at BGSU+FLAAR from IJ Technologies.



FAQ on Wide Format Inkjet Media

A list of the most notorious horror stories of disasters with inkjet media. Many of the people who related these stories lost their clients; and some companies went effectively bankrupt due to poor taste (or wrong choice) in inkjet media.

We can't save you from making your own wrong decision, but we can sure provide warnings, advice, tips, and suggestions to at least your chances of survival are higher than people who don't read FLAAR reports.

Indeed we maintain running lists of the problems that people write us about. These primarily go into the Survival Series, since often they are printhead related. The present report covers situations related to inkjet canvas, photobase, coated bond, and all the synthetic inkjet materials.

Contents

- Introduction
- Reality
- Horror stories
- Supposedly waterproof Media that washes off the sign in the rain
- Media that never dries
- Longevity
- Fuzzy letters
- Gloss surface; poor gloss
- Humidity problems
 - Humidity and Banding
 - Humidity and deterioration of the print
- Canvas whose surface falls off...
- Gloss surface; poor gloss
- Bronzing
- Metamerism
- Grayscale Images Look Magenta or Greenish
- Inkjet Media whose surface abrades off too easily
- Edges curl; the upraised edge catches the print head and destroys it
- Fingerprints and other tips for handling media
- Dust, cutting remnants, or other surface debris causing head failure
- Thick material causing problems with auto-cutter
- Oil or other vehicle of ink showing through backside
- Swellable polymer media compared with microporous media
- Inkjet Coating changing without you being informed
- Inkjet media that you can fold
- Summary: Questions to Ask before you Decide which Media to Use
- Bibliography
- Sources and Resources on the Internet

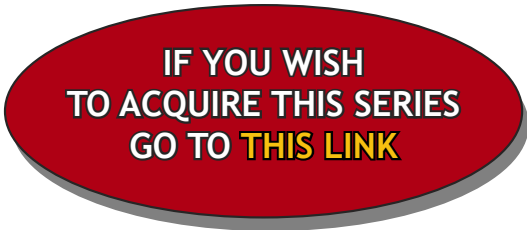
Advisory

Just remember, media reacts differently depending on your ink, temperature and humidity of your facility and what software you are using. Output will look different depending on whether your printheads are new or worn (yes, even piezo printheads wear out despite claims they are “permanent”).

Media that works just fine in a FLAAR lab may react differently in your lab, so be sure to test yourself before you buy a whole skid of the stuff. Also be sure to test before you have a deadline or a make it or break it client who needs things yesterday. That is not the time to experiment with a new media.

Every ink, printer, RIP, and media has a few shortcomings. Sometimes the printer software simply can't generate pure colors; the software keeps wanting to mix a little of the other colors into the recipe. So no matter what the list price of your system, be realistic... they are not yet quite perfect. Even your spouse and children have a few flaws of character or behavior. So you try to concentrate on what works well and do your best to work around what is still not technologically flawless. At least the new generation of printers such as Epson 7600, 9600, 10600, the HP DesignJet 5500, the new Canon printers, the Mimaki JV4, Mutoh Falcon II, and hopefully also the next iteration of Roland printer are each a major improvement over the HP 250 and Encad NovaJet 4. Even the Fuji-Brady printer and XES Xpress of as recent as 2000 are sad reminders of early generations of printers when compared to what is being showcased at SGIA 2003 a mere three years in the digital era.

You will be successful with your selection of media when you master color management and RIPs. Thus we have color management and RIPs each as a separate series.



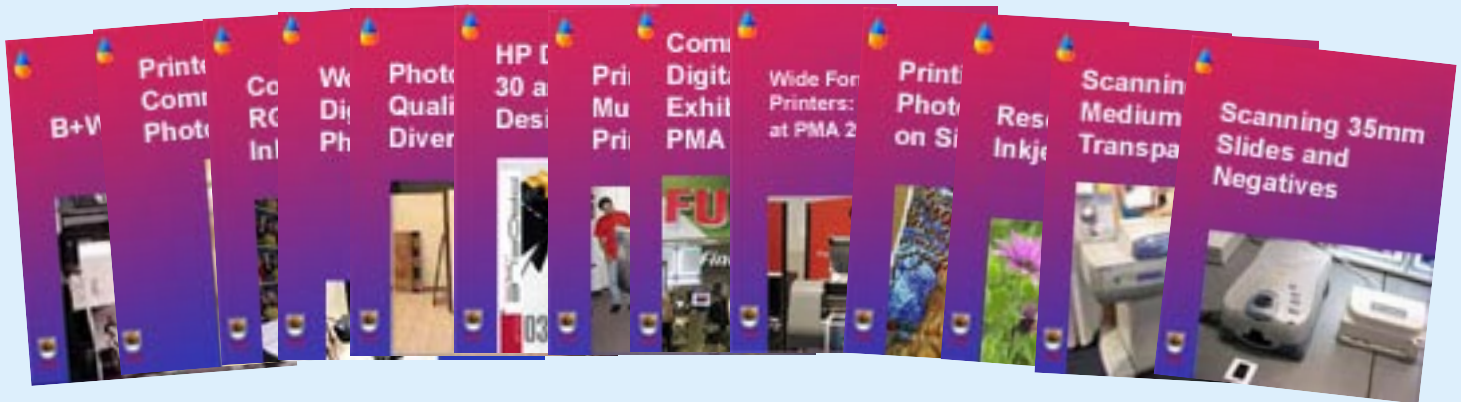
www.wide-format-printers.org	www.fineartgicleeprinters.org	CLICK HERE TO VIEW EACH FLAAR NETWORK SITE
www.digital-photography.org	www.flatbed-scanner-review.org	
www.laser-printer-reviews.org	www.cameras-scanners-flaar.org	www.large-format-printers.org
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Acquire these reports at:

www.wide-format-printers.net

Wide Format Printers for Photo Exhibit Quality Series



UV - Curable Flatbed Inkjet Printers Series



Wide Format Printers for Signs Series

