



Laminating Equipment for Large Format Inkjet Printing



Ledco laminator presented at PMA Trade Show



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The principal laminating equipment companies

GBC and Seal (Hunt) are two main laminator companies for industrial strength equipment for commercial use.

LEDCO, CODA, and Advanced Greig Laminators are three other companies that make large laminators.

LEDCO and USI are the two companies I know of for entry-level and mid-range lamination equipment. These laminators cost about 33% or even up to half those of GBC or Seal. However equally obviously low-cost laminators are for schools or SoHo use, not round the clock industrial use in a commercial sign shop.

LEDCO actually manufactures their own laminators, which means they know every aspect of their equipment. So when it comes to training, LEDCO is a good source of information. FLAAR is visiting the LEDCO headquarters in nearby Cleveland to learn more about the various product lines, as well as how their laminators compare with GBC, Seal, CODA and other such companies.

FLAAR has been slow to obtain a laminator. We now have two. First one was a table-top pouch laminator model from LEDCO, their model LEDCO XL44, which handles up to 44 inches. LEDCO will shortly be presenting a 27" version.

FLAAR recently installed a 42" laminator that was provided to us by USI to put it to the test. Just as soon as we have more experience with this laminator, we will report back about how the testing went.

USI's e-mail is jhewes@usi-corp.com What I like about USI is that they have a thick catalog that offers hundreds of kinds of supplies, accessories, trimmers, and basically, everything you would ever need for your shop. We highly recommend you getting your hands on the catalog from USI.

Equipment from LEDCO and/or USI is for people just entering the market, for their first-time laminator, for the occasional use up to light commercial use. Equipment is priced accordingly.

Equipment from CODA, GBC, Seal or LEDCO will fit the needs of universities or museum as well as the commercial needs of a print or sign-shop.

FLAAR will be conducting on-site interviews of sign-shop owners to find out precisely how long each make and model hold up under full-scale commercial use while running the laminators day and night. Usually the equipment is priced for such performance.



GBC laminator at Graphic of the Americas



USI laminator at ISA tradeshow



You will probably want to mount your images on board from time to time. So be sure the equipment can mount as well (something you can expect from industrial-strength equipment from the better companies.

Seal is also known as Hunt. I can never keep the companies distinguished. Seal was recently purchased by Neschen from Hunt. GBC, however, is a completely separate company from Neschen-Hunt-Seal.



LEDCO laminator

An example of one of the nationally known companies: LEDCO has about 14,000-entry and mid-range class of laminators in educational institutions (FLAAR is at a state university). But nowadays, the markets are from kindergarten on up to graduate school and museums.

Then there are wider LEDCO laminators for wide format inkjet printing. At the top are industrial units up to 60" wide. That is why FLAAR selected LEDCO because our readers come from both the light-duty and heavy-duty commercial categories, not just in one or the other.

At recent ISA and SGIA tradeshow we were also looking at the wide range of offerings from Seal and GBC. We especially like the liquid laminating solutions which don't use smelly and dangerous solvents. We also were impressed by the sophisticated new projects of these companies such as Accushield from GBC. We also like the printable laminate from Rexam (InteliCoat). More details on new laminating technology is in the FLAAR Report on ISA '03 tradeshow.

If you do not want to laminate

Laminating can prevent water from ruining your inkjet prints. Another option is to get a waterproof media, such as that from IJ Technologies (e-mail liz@ijtechnologies.com).

Laminating can help, somewhat, in preserving your image from the sun, although a good-pigmented ink is essential. If you use pigmented, solvent-based ink then you can escape lamination. The downside is that pigmented, solvent-based inks tend to be used in printers with Xaar piezo heads. These are low dpi heads, nothing like the nice output from Epson piezo heads in Roland, Mutoh, Mimaki or Epson printers. Output with Xaar and comparable heads tends to have noticeable banding and generally a dotted background appearance as well. Of course, you do not notice such imperfections when viewing from a distance of 6 feet.

Oil-based inks hold up better than water-based inks, but some oil-based prints may be difficult to laminate. On that subject, sometimes the lamination will lift off the surface of even a normal, water-based, inked print. This is due to the fact that virtually all media used in normal inkjet printers must be coated in order to receive the inks. The adhesive from the lamination of course lifts up on this coating, and may (rarely) lift the coating all the way off the paper underneath.



3M UV curable inks



Another way to avoid lamination is to use the UV curing system from FIRST, a French based company (sold under another name in the United States by SignWarehouse and also available via ColorSpan). The downside is that the paper width is limited to 36 inches, the media is very expensive, and a heat treatment is required (which is actually rather simple and the machine is not expensive, only the special media). Also, even FIRST admits that the resultant print will hold up even longer if lamination is used subsequently.

The UV curing using a process sold by FIRST, is not in the ink; the image is printed with any normal ink using a regular printer. However, you use special resin-coated media from FIRST. Once heated, this coating undergoes polymerization under a UV treatment (in the FIRST UV oven, so to speak). The surface turns into a plastic-like protective coating. So you have the cost of the special media, plus the heating machine. Then, you also need to laminate it anyway. But you do get a sort of double protection using this method.

By next year we should have reports on lamination equipment and on liquid lamination. There are countless thicknesses of lamination. There is glossy, matte; indeed you can have glossy on one side, matte on the other. You can choose to spray it on, cold laminate, hot laminate, and so on.

Advantages of Lamination

In most cases lamination will make an image look more eye pleasing. Colors pop and become brighter. We did some prints on an HP DesignJet 1055cm, which is a CAD printer and not a fine art printer. But when we lacquered them with a spray from the local mounting shop, they were good enough to exhibit in the museum on our campus. In other words, a laminated print may add value. This results in more income for your printing facility.

Most pigmented inks for standard inkjet printers have less color gamut than dye based inks. Thus if you use pigmented inks and then laminate the image, the combined result will be brighter and more attractive than the same image using dye inks but un-laminated. Some laminates on certain types of images may increase contrast in addition to making the colors look brighter.

But the main advantage of laminating your prints is that you can get away with using media at a lower cost. Budget media laminated may look as good as, if not often better than, the most costly photo media. Besides, most UV inks will not print on glossy paper. If you want a full rich appearance you almost have to laminate. Indeed we caught Epson USA using lamination to increase the attractiveness of their otherwise lackluster-pigmented inks and their even duller media (at trade shows in early 2001).



Epson print laminated

Lamination keeps off fingerprints and spills. Since FLAAR editors travel a lot, we need our images to be laminated in order to hold up. The more expensive inkjet media can be ruined in seconds by just laying it on a table. Merely letting the media go over the edge of the table will put a permanent crease at that spot. So if you laminate an image, you can potentially use it more than once.



Although lamination will not stiffen an image as much as mounting it onto a board of some material, thick lamination, especially encapsulation, will indeed make even paper stiff.

What to be careful of?

Oil-based prints cannot be laminated as easily because the laminate will not stick well to the oil. Improved media and inks eliminate some of the problems; besides, most oil prints can hold up for six months without lamination, which is usually long enough for event signage.

Some synthetic media cannot be spray-laminated. The chemicals in the spray have the ability to dissolve the media or otherwise cause disfiguration (shrinking) of the media.

So be sure to test any new media that you try out. We did 60 prints on a new media, unaware that this material could not be lacquered.

Some other media will not laminate well; the laminate pulls off the powered inkjet coating.

Media with too much ink saturation may not allow the laminate adhesive to stick properly, and may eventually delaminate.

Some sprays may turn unpleasant colors, such as yellowing. Thus do not buy fixative on the Internet. Buy only at a reputable place that specializes in wide format inkjet prints in order to get the best quality of color.

And most of all, test everything that you indeed to do, well before your deadline.

Most laminating companies are completely honest. There are, however, a few potential scams by clever companies who realize that most Americans will believe almost any advertisers claim with big numbers.

So if anyone offers 100 or 200-year fade guarantee, or that “our coated prints have experienced no fading in over five years of direct sunlight!” Let this be a warning. Please be careful. No “warranty” is valid if the company does not honor it. Anyone can print a “warranty” guarantee. Anyone can promise up front. But when your prints actually fade and you have lost your money, how do you know that in fact you will get your money back? Or maybe you believe in the tooth fairy?

The only warranties accepted by the industry are those by 3M and Avery. Those are both Fortune 500 companies with outstanding products and highly respected as ethical.

Laminating Photos and Fine Art Giclee

If you are doing fine art prints, it is essential to get your inks and media (and preferably your printer also) from a company that knows how to produce fine art prints. This way they can give you some tips on lamination as well. Although they may not necessarily sell the lamination equipment, they can help you reach a decision. This is crucial because you need to coordinate your lamination with what inks, media, and printer you are using. Hence we recommend Parrot Digigraphic, (e-mail [dhunt@parrotcolor](mailto:dhunt@parrotcolor.com)). Parrot also sells RIPs, plus inks and media for fine art.

FLAAR itself is issuing a new report on brush-on, spray, and liquid lamination of fine art prints. This is because you obviously do not want to put a sheet of plastic lamination on top of a watercolor or canvas print. For these types of prints, a brush-on, spray or liquid (dip) lamination is the traditional method.



Our new report by Nicholas Hellmuth lists actual name brands and the most trustworthy sources of materials. This new report will be part of the SERIES on Giclee printing, which can be ordered from www.wide-format-printers.NET.

If you are doing photo-realistic prints you will most likely be using a Hewlett-Packard, especially the new HP 5500ps. This printer can also produce fine art prints. The most knowledgeable HP dealer we have found so far is Color DNA. They surely know what roll fed laminators to recommend for HP, ColorSpan, Encad, or Canon (all thermal printhead systems). Contact colorguru@colordna.com

Entry-level laminators used especially for universities, colleges, museums, churches, etc.

If you just need occasional lamination and only up to 25" width, consider the entry level 25" School Laminator from LEDCO. There are two other versions for commercial needs.

Entry-level laminators for sign shops or wider needs for institutions

When we visited a sign shop in Toledo, they had about five large format printers and two LEDCO laminators, probably 50" in width. The sign shop floor manager said they LEDCO laminators performed just fine. They did not seem eager to jump to some other brand. Since we do not yet have a laminator that can handle our HP 5000 or ColorSpan printer output, we are unable to comment further. FLAAR will be adding a large format laminator sometime later this year.



LEDCO laminator, used at FLAAR-BGSU

Since LEDCO is headquartered near Cleveland, Ohio, and as FLAAR is headquartered at Bowling Green State University, Bowling Green, Ohio, we naturally tended to gravitate to a nearby company in Ohio. FLAAR editors had seen their products at trade shows for the last several years and then had interviewed end-users who actually had LEDCO laminators in their sign shops.

National Geographic Society chose LEDCO laminators when they needed to laminate 145,000 maps of 4 x 6 feet in size. If LEDCO laminators are good enough for National Geographic maps, their equipment is certainly acceptable for our university needs.



GBC laminator compatible with HP media at GraphExpo trade show

We visited the LEDCO headquarters outside Cleveland and noted the experience this company had in laminators. They design their own products based on practical considerations. This company clearly knows laminators inside out.

USI also offers laminators for SoHo use, for classrooms, and for entry level at up to 42" wide. Their catalog offers an illustrated glossary, which is another reason that we recommend you acquire their catalog. USI also sells desktop binding systems, so your school or university can order everything from a single source.

Heavy-Duty Commercial Laminators

During upcoming trade shows, we will gather more information on the wide format laminators of Seal, GBC, Coda and LEDCO that would be most appropriate for laminating large format inkjet prints.

At GraphExpo (Oct, 2002) we noticed that GBC has a program to certify specific HP media as instantly laminatable. That is, you can print with your DesignJet on specified media and it can immediately be laminated (that's right, with no dry time needed). This program is very new, so not all dealers may be aware of it. One HP dealer you can try is Jonathan Knecht, telephone 888 BIG-COLR, or e-mail at colorguru@colordna.com.

Mounting

Most good laminators can also handle mounting, but do not forget to double check to make sure. Mounting usually means affixing to foamcore or to other thick and/or rigid material. The other option is using a dry mount press.

Laminating Film

After you decide what laminating equipment you will use, the next step is to decide what lamination film or liquid to use (if by chance you select a liquid laminator). Indeed first options are film or liquid. If using a spray-on or a liquid laminator machine (very effective, but expensive and environmentally unfriendly as harsh chemical smells may well be very nasty to your health).

3M makes laminate in 36" and 54" rolls and in gallons.

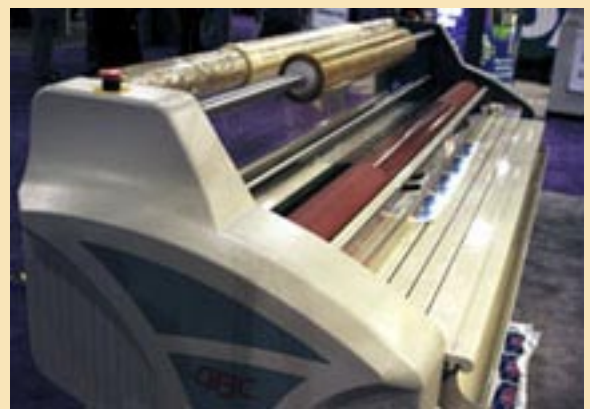
After you slice up the surface of your regular tables, you will eventually realize that you need a cutting mat and a safety ruler.

Trimmers and Cutters

A trimmer is absolutely essential. This is the cutting device you use to trim off the borders or excess media. Using a straight-edge and X-acto knife is rather rough on your table top (and may cut off the tips of your fingers).

We started off the cheap way (straight-edge and X-acto knife) but found it was not productive. If you slip, besides getting blood on your print, you may cut into the print and have to print it all over again. So at both universities, one after the other, we finally faced up to reality and got a trimmer.

If you use foam board be sure your trimmer is good enough to handle such thicker material.



GBC Aqua Seal laminator



Trimmers and cutters



Whether you need just a basic trimmer for a new print shop or even if you need more of an industrial strength item of equipment, then check out the wide range of trimmers offered by www.reprographicdesigns.com. They carry serious cutters and trimmers from Meteor, Keencut, Rotatrim, and Neolt. All of these are available from Mike Lind at malind@msn.com, Reprographic Designs.

Perhaps the people at Reprographic Designs can explain the difference between a cutter and a trimmer too.

Other aspects of finishing your large format prints

For most people, laminating will be the final step. You can go one step further to produce vehicle graphics with DuPont Teflon if you choose to do a vehicle wrap. You can telephone DuPont directly at (877) 404-6243, or visit their company's website at www.teflon.com. In other words, you could cold laminate the already normally laminated print with Teflon film coated with pressure-sensitive adhesive. Now you can wipe away bird droppings, grease and oil, and generally wash the vehicle with less worry about disturbing the original lamination layer underneath.

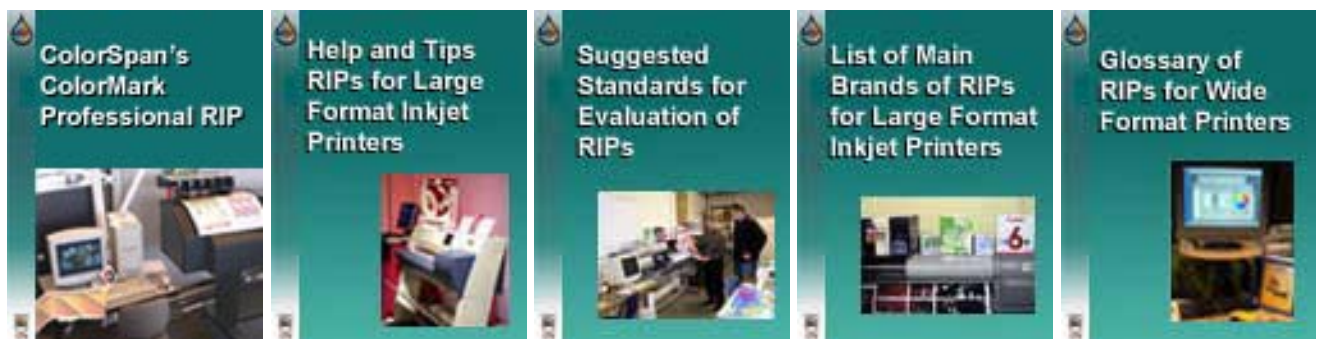
Model designations change often and we would have to expend considerable funding to test each make and model, so we regret for the present time we can only provide a general survey.

In most cases, the image appearance is improved considerably by laminating. Actually you can use cheaper paper, laminate, and have the resulting image look as though it were done on costly photo-glossy or photo-matte. Cheap paper plus lamination may cost less than photo-glossy media unlaminate!

Why you need RIP software to improve your lamination?

Laminate may peel off or otherwise not stick if you have too much ink on your media.

The way to cut down on excess ink is through your RIP software. Of course if you don't have the proper RIP software, or if you are unfamiliar with how to lower the ink amount, then you ought to order the FLAAR Report SERIES on RIPs.



Other FLAAR Reports

Laminating Wide Format Inkjet Prints: Glossary of terms, new June 2003. Sooner or later you will need to know at least the basic facts about lamination and the difference between color lamination and hot lamination. Whether you are a sign shop, photo lab, screen printer switching to inkjet, or in-plant print facility in a corporation, this comprehensive glossary will be helpful to understand lamination equipment, supplies, and techniques. This informative report also provides tips on where to go for free manuals which will explain whatever else your heart desires to learn about laminating inkjet prints.





Questions to Ask before you Buy or Pay For a Laminator for Inkjet Prints, new June 2003.

This is one of the FLAAR Reports which serves to assist the owner or operator to save their hard earned money by becoming a savvy buyer. An educated buyer makes it tough for anyone to fool you.

What you can still do to a Giclee Print, After you have finished printing them

- Clear-coating
 - (Liquid) laminating
 - Painting on top of an inkjet print
- Every week painters are asking
- "how should I laminate or clearcoat my prints?"
 - "What varnish will not crack or turn yellow with age?"
 - Many artists ask, "How can I paint on top of my inkjet print once it is printed?"



So Professor Hellmuth did the kind of research you would expect and also checked around and has issued the first stage report, which is a FLAAR Fast Facts.

Other sources of trustworthy information

Seal is an internationally known and respected company. We do not have any relationship with them, but know their products from dozens of tradeshow. You can perhaps get further information from the one person we know at the company, Angie Mohni, e-mail a.mohni@sealgraphics.com. She knows wide format inkjet printers very well.

Laminating equipment and supplies, USI, e-mail John Hewes, jhewes@usi-corp.com, fax (203) 245-7337. The USI catalog is the most comprehensive I have ever seen and covers a wide variety of equipment and accessories for countless aspects of printing and finishing. The USI catalog is worth taking the effort to get a copy.

For cutters and trimmers, contact Mike Lind, malind@msn.com.

For information on how to laminate fine art giclee prints contact John Lorusso at jlorusso@parrotcolor.com. Of course, you would not want to laminate a giclée print, but instead use either a liquid or spray treatment. A print can be ruined quickly if the wrong stuff is used.

For information on laminating the output from Hewlett-Packard DesignJet printers, contact Jonathan Knecht, e-mail colorguru@colordna.com.

For information regarding FIRST UV curable system via ColorSpan printers, send an e-mail to productinfo@colorspan.com.

If you need a RIP for any Hewlett-Packard printer, our technical staff prefer PosterJet. Their website is www.ScarabGraphics.com.

Avery Dennison offers courses on laminating films, contact Tom Durner, **fax** (770) 499-2088. Avery Dennison also gives away free a practical desktop liquid laminator when you buy a certain level of the laminate per year.



Resources on the Internet

www.celloglas.com/trfaqlaminationvarnish.htm (FAQs on lamination and UV varnish).

www.dow.com/webapps/lit/litorder.asp?filepath=stickwithus/pdfs/noreg/500-01396.pdf&pdf=true (lamination troubleshooting guide)

www.encad.com/Media/Laminates/feat_thermal_backing.html (Kodak material for backing POP signs so you don't get see-through due to ambient lighting).

www.epsassociates.com/newsletters/Q4%202001.pdf (comments on laminating, Part 1)

www.epsassociates.com/newsletters/2002%20Q1.pdf%20 (comments on laminating, Part 2)

www.expression-vct.com/support.htm (brief FAQ on lamination)

<http://groups.yahoo.com/group/DigitalBlackandWhite-ThePrint/message/22> (varnishing inkjet prints)

www.gwjco.com/laminatingproblems.htm ("Laminating Problems and Solutions")

www.hotlaminators.com (contains several pages of helpful information on pouch lamination).

www.ledcoinc.com/digp_s.htm (LEDSCO and its partner companies are a good source of reliable information on how to resolve laminating problems).

www.oce.co.uk/Helpdesk/Files/06troubl.pdf (lamination and encapsulation troubleshooting).

www.p2p.com/DMfaq.html (useful information on laminating).

www.sihlusa.com/sihl/html_documents/tech_support/applications/mounting_and_laminating.htm (helpful discussion of laminating inkjet prints).

www.signweb.com/digital/cont/inkjetques23.htm (Preventing Major Problems in Laminating Inkjet Prints, David Goetter, for The Big Picture Magazine)

www.tricoat.com/pdf/d412.pdf (for Bulldog Ultra mentions "testing lab in Northern California" without giving the name.)

Be cautious and street wise

Be wary of excessive claims for longevity with laminating materials (spray, liquid or film).

If the claim is too good to be true, it probably *is* too good to be true. Check the Better Business Bureau before you spend your money with an unknown product, and also ask other photographers, artists, or sign shops about any product that makes outlandish claims (whether ink, media, laminate, or printer).



Lamination systems used at both FLAAR facilities (Francisco Marroquin University and Bowling Green State University)



Anyone can offer a warranty; anyone can offer a guarantee. The question is whether they will bother to refund your money once you pay the invoice. Use only a credit card and refuse payment if the project is inadequate. If you use a Gold American Express card in most circumstances, you can demand a refund from the credit card company if the product is defective; even if several months later.

GBC, SEAL, LEDCO, USI, and other companies mentioned in this report are reliable within what you expect of any normal company that is well known and respected. However there are other companies that have an infamous record, so again, check with the Better Business Bureau before you purchase any unusual laminate and especially before you buy any laminating machine that is not publicly visible at major international tradeshows.



SEAL lamination system at ISA'03 trade show

If a company does not have its own booth at SGIA, ISA, Photokina, CeBIT, Seybold, or at least at B.I.G., I would begin to ask around about their equipment. I would wonder why that laminating company does not show themselves in public.

Advisory

We are quite content with the specific equipment we have in the two FLAAR facilities at the two universities. We would obviously never ask for a printer, trimmer or laminator that we knew in advance would not be good. But we cannot guarantee or certify any make or model because we do not know the conditions under which a laminator might be utilized in someone else's facility. Heat, humidity, dust, and experience level of your workers (whether they are new or have prior years experience): these are all factors that will differ in your place of business as compared with our two universities.

Actually you may have people with even more experience than we do, since we deliberately use students to approximate newbies. FLAAR is devoted to assisting newcomers in learning about digital imaging hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

Just remember that every laminator has its quirks, even the ones we like. However, it may be that the specific kind of printing you need to do may never occasion that shortcoming. Or, it may be that your laminator was manufactured on a Monday and has defects that are atypical and show up more in the kind of media you use which we may not use as often during our evaluations. Equally possible is a laminator that may be a disaster for someone else and yet work flawlessly for you and be a real moneymaker for your company.

Therefore, be sure to test a laminator under your own specific work conditions before you make a purchase. Check with other people in your area, or in the same kind of print business that you do. Do not rely on references from the reseller or manufacturer (you will get their pet locations which may be unrealistically gushy): find someone on your own.

Although we have found several makes and models to work very well in our facilities, how well they work in your facilities may also depend on your local dealer. Some dealers are excellent; others just sell you a box and are unable to provide much service after the sale. If you pay low-bid price, you cannot realistically expect special maintenance services later on. Indeed some low-bid Internet sales sources may have no technical backup whatsoever.

Acknowledgements

We wish to thank USI for providing a 42" laminator for us to evaluate at Francisco Marroquin University and LEDCO for providing a pouch laminator for FLAAR at Bowling Green State University. We thank Mike Lind for providing a trimmer for both universities so we could evaluate them.



FLAAR Digital Imaging Resource Center

- www.wide-format-printers.org
- www.FineArtGicleePrinters.org
- www.digital-photography.org
- www.flatbed-scanner-review.org
- www.large-format-printers.org

First level reports are distributed by FLAAR at Francisco Marroquin University. There is no charge for first level reports. If you need in-depth information about RIPs, wide-format inkjet media, and are curious about the truth relative to hype about thermal vs. piezo printheads, these second level FLAAR Reports are all pictured on www.wide-format-printers.NET.

Additional evaluations by FLAAR at Bowling Green State University, Ohio

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Obviously if you have difficulty handling a basic PDF file.

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