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Arkwright & JOBO Announce Launch of PHOTOBRYTE™

Digital Imaging Paper & Film

Arkwright, Incorporated, a worldwide leader in developing, coating, converting, and marketing imaging processing films and specialty substrates, and JOBO Fototechnic, Inc. announce PhotoBryte, one of the broadest line of desktop photo-quality digital imaging papers and films available in the supplies market today.

PhotoBryte products are designed for use in virtually all desktop color ink jet printers, including Apple, Canon, Epson, Hewlett-Packard, Lexmark, NEC, Olivetti, and Xerox. All PhotoBryte products are fast drying, smudge-resistant and fade-resistant.

"PhotoBryte Digital Imaging Paper & Film products allow you to produce photo-quality color prints with your ink jet printer," says Bob Cole, vice president sales and marketing for Arkwright, Inc. "You can print photos, window decorations, overhead transparencies, photo business cards, photo greeting cards, and unique art renderings using Web-downloaded, scanned, floppy/CD, or digital photo images."

"With the rapid improvement in photo-quality ink jet printers, the photography market is quickly embracing digital photography." says Ricke Stauffer, President of JOBO Fototechnic, Inc. "Arkwright and JOBO together intend to bring photo quality ink jet materials to this market through the traditional camera store and photofinisher."

Arkwright/JOBO's 1998 PhotoBryte launch includes the following products:

Hi-gloss Photo Paper – Bright-white glossy paper for brilliant, sharp color images.
Clear Kling Film – Clear adhesive-backed film lets you create colorful panels to place on glass and other smooth inside surfaces.
Ink Jet Transparencies – Clear transparency film for sharp, rich images.
Hi-gloss Photo Business Cards – Bright-white glossy paper for brilliant, sharp color images.
Hi-gloss Photo Greeting Cards – Bright-white glossy paper on one side for brilliant, sharp color images.
Kanvas Art Paper – Canvas-textured ivory sheets make prints look like they're painted on canvas.
Arkwright Roll Materials – Available in a variety of sizes (24"- 60"), lengths (25 - 100'), and materials (Hi-gloss paper, Lo-gloss paper, Backlit film, Clear film, etc.)

Call 1-800-664-0344 and ask for more information!

E-6 Processing Update

by Ken Owen

Recently, I had the privilege of attending a Kodak E-6 seminar as a co-speaker with one of the experts from Kodak's Marketing Technical Support team, Jay Beehner. Jay has been a specialist in reversal processes of all kinds for the last 15 years, and very few people know as much about the E-6 process as he does. I was brought in because of my 15 year's of experience in rotary processing. Together, we were there to raise the understanding of rotary processing for users from Michigan and Ohio. The best part for me was being able to pick up new information and tips from "the source" on E-6 processing, so I can share it with you.

Mixing Tips

Don't get carried away with high temperatures. Hot water carries more oxygen. You've probably noticed when you fill a glass with hot water how it seems a little cloudy at first, and then clears up as it settles. That's the visible evidence of the extra oxygen, and all that extra oxygen can oxidize the developer. Jay referred to a recent experience of a customer mixing their developer at about 150ºF, and how the developer was virtually dead in 24 hours. Nobody could figure out what was wrong until someone from Kodak watched the customer mixing the chemicals. They figured if warm water was good, then hot water would be better, and really hot water must be great! WRONG!

Mix the developer in warm water. If you plan to wait a while between mixing and processing, then try using water at about 85º F (approximately 30º C). It is warm enough to do the job. If you are planning to use the chemicals immediately after mixing, then go ahead and use 100º F (38º C) so the chemicals are close to the target temperature when you are finished.

Another common mistake is stirring the developer concentrate too long or too vigorously. Once again, you want to avoid anything that is going to add oxygen to the developer. Over agitating during mixing can be bad. Just stir it carefully so you don't introduce air into the solution, and just do it until the solution appears evenly mixed. Mixing a liter will probably take less than one minute, but the time will go up with the solution volume. Recently, I was in a lab setting up one of our TecnoLab hanger processors. We mixed 30 liters of developer in about 3-4 minutes.

One last mixing reminder: When there are several concentrates for a single solution, such as Color Developer, add the first part and stir. THEN add the next part and stir. It can be very important with some chemicals that they be mixed thoroughly BEFORE adding the next part. Otherwise you may not get the solution you expected.

The Film Doesn't "Look" Right

If the images in your E-6 films don't look as bright and contrasty as you expect, or the colors seem muted, rather than brilliantly colorful, you may have a problem with retained silver. Unlike black and white negatives, color transparencies are not supposed to have *any* silver left after the process is complete. There should be essentially nothing more than the dyes. Any remaining silver acts like a neutral density filter, causing the whites (and everything else) to be a little darker than normal, and occasionally even adding a slight color cast.

The good news is this type of problem is usually recoverable, especially if you haven't cut up all the images and mounted them in slide mounts. Just get out the last half of the process and do it over again. In a 6-bath E-6 process this means starting with the Conditioner or Pre-bleach, and continuing with Bleach, Fixer, washing and soaking in stabilizer (or final rinse) once again. With a

3-bath E-6, start with the Color Developer, Wash, Bleach/Fix, then wash and soak the film in stabilizer again. Make sure you re-run this half of the process at normal processing temperatures. You can relax about how long to immerse the films on this corrective procedure. Every step after the Color Developer is a "completion" step. You cannot hurt the film by leaving it in the solution too long. Once there is no more silver to "eat away", the solution has nothing left to do.

If you find that you frequently have to perform this corrective action after different processing sessions, then it is time to modify your processing times. We suggest that you start by adding about 50% more time than what you had been using to the Conditioner or Pre-bleach, Bleach, and Fixer baths. And if you do a lot of high speed films (higher than ISO 400) then it's probably a good idea to add this 50% anyway. Faster films have more silver in them, and may take longer to be bleached and fixed.

Until a couple years ago, we did not have to go back as far in the process to get the complete clearing results. But with the advent of all the new T-grain films from Kodak and similar products from Fuji and Agfa, it is necessary to re-treat the film in the Conditioner or Pre-Bleach (which is hidden in the Color Developer of 3-bath E-6) in order to reach the "fine" grains of silver in the emulsion. It can make the difference between the appearance of an overcast day, or a bright sunny day in the results of the images.

Here's one last tip on this subject. If you have any strange results in your E-6 film that appear to have essentially normal colors, but dark or with a mildly dominant color to them, try using the last half of the process a second time. It virtually cannot hurt the film, and it might solve your problem. But if the film is real light, streaked, or wildly colored, there is not much hope that this procedure will be of any help.

Speed, Contrast, Balance

Normally, in rotary processing, E-6 Kit chemistry works "straight out of the box". For most users, it is unnecessary to make any adjustments to the solutions in order to get their desired results from the film. Occasionally, several adjustments are necessary to the chemicals to make the films look "right". It is important to do them in the right order. First adjust the chemicals for the correct film speed, then the correct contrast and, finally, the correct color balance.

Before you can make any other corrections, you must get the speed right. By speed we mean the correct density of the film, for a correctly exposed image. Assuming the camera and light meter are working correctly (and there are war stories about those two elements of the dilemma), processed film should have a correct image density when finished. The highlights should be totally or almost totally transparent, and the shadows should be deep black. If the film exposure appears to dominate at one extreme or the other, then it is reasonably likely that the First Developer time needs adjustment. (Check the frame numbers of the film too. Maybe your camera or light meter aren't working correctly after all! The frame numbers were put there by the film manufacturer, and they can be trusted as a reasonable, although limited, judge of proper processing.) If the images are too light, shorten the First Developer time or lower the temperature. If the images are too dark, then extend the First Developer time or increase the temperature. We recommend that for rotary processing you try 6:30 as your base time for the First Developer. However, it would not be unreasonable to have a time as short as 5:30 or as long as 7:30 to be considered normal. It has been our experience that the vast majority of JOBO's E-6 rotary customers find a time close to 6:30 to be right for them.

Now that you have the density right, it's time to consider the contrast. Realize that this consideration is going to be rather subjective . Too much contrast for one photographer may be just right for another. Start with a subject with a reasonable contrast range. Avoid beach scenes which will inherently be very contrasty, and also avoid the image of the "black cat in the coal bin."

Typical snapshot images should be okay, or a picture with a step wedge such as the JOBO Color Control Card will also work.

If the image seems to need more contrast, then add 5-10 % more water to the Color Developer. On the other hand if the image seems too contrasty already, then you will need to use 5-10% less water the next time you mix your Color Developer. (Or you can add a bit more chemical concentrate to the current batch of Color Developer solution.)

Now that you have the speed and contrast in control, it's finally time to tackle the color balance if it is not quite right. If the color is shifting toward cyan or red, then the problem is likely to be in the temperature of your first wash. If the temperature is too cold, it can cause the images to shift cyan. If the water temperature is too hot, the images will generally shift red. Most importantly, run the wash water at the same temperature every time. It's best to target the water temperature at 100º F (38º C) as a starting point.

If the color is shifting yellow or blue, then it's time to go after the pH of the Color Developer. That involves sodium hydroxide or sulfuric acid. Those chemicals can be rather dangerous to handle, so we'll side-step the topic for now. If you really do need the details for using these chemicals, contact JOBO. Our Tetenal E-6 kits have pH correction details in their instruction manuals.

One other item that can cause a blue shift is the concentration of the Reversal bath. If it is too strong, it can cause a blue cast to your images. Make sure that when you mix it, the instructions you follow for rotary processing include mixing 30ml of concentrate to make 1 liter of working strength Reversal bath. If your instructions call for 50 ml per liter, then the Reversal bath will be too strong.

What about formaldehyde in the E-6 process?

Most of you know that most stabilizers include formaldehyde or formalin in their constituents. Many of you may be aware that not too many years ago, Kodak took the formaldehyde out of their stabilizer to make it safer, but you may not realize they really transplanted it into another bath. Kodak created a method of sequestering the formaldehyde within the Conditioner step, so that it is virtually non-existent at the time of mixing, but appears as a by-product of the film going through the solutions. This way commercial lab technicians could reduce their exposure to this hazardous chemical.

To identify the changes in the process, Kodak changed the name of Conditioner to Pre-bleach, and they changed Stabilizer to Final Rinse. Kodak created a patented technique to accomplish this feat, and so far only Kodak and L.B. Russell chemicals offer it. All the other chemical manufacturers continue to offer Conditioner and Stabilizer.

At this point you may be asking "If formaldehyde is hazardous, why can't I just avoid it altogether?"

The answer is in the image. If you want your E-6 images to last then the film MUST go through a step containing formaldehyde (or formalin). Without it the magenta dye-coupler is unstable and the film will turn green as it ages.

Some years ago we tried processing Agfa, Fuji and Kodak films without using any formaldehyde-containing solutions. The result was colorful. In six months, the Fuji films had turned very noticeably green. At one year, the Agfa and Kodak films had also turned green, but not as badly as the Fuji films. These tests were conducted on films of about 10 years ago, so things may have changed today, but according to all sources, the results are principally the same: films turn green without formaldehyde.

Push and Pull Processing

Push and pull processing refers to increasing or reducing the developing time to alter the density of the images to correct for non-standard exposures. It could be that you accidentally under-exposed your films, and you want to save them by changing the process. You can also get some interesting effects by deliberately under- or over-exposing the film and altering the process times. With most films, pushing them causes a warming effect, while pulling them causes the images to be colder.

The term "push" applies to increasing the developer time to compensate for under-exposing your film. The term "pull" applies to "pulling" your film out of the developer earlier than usual to compensate for over-exposed film. For instance, if you are using ISO 100 film, and you exposed it at ISO 400, then you need a 2-stop push to make the film look essentially normal again.

Normally, push and pull processing are controlled only by increasing or reducing the First Developer time. But in rotary processing, we at JOBO have recommended a reduced Color Developer time for normal processing. Four or five minutes works well as the "normal" Color Developer time in most darkrooms, but when you push process at times to correct "1 stop" or more, it is usually necessary to change the Color Developer time back to 6 minutes.

JOBO and Kodak agree on a general push/pull time chart. Start with your normal developing time, whatever it is. For the purposes of this article, let's assume it is the 6:30 that was recommended earlier. If you want to push your film one stop, add 2 minutes to the First Developer time, for a total of 8:30. If you want to push your film two stops, then add another 3 minutes to the previous time for a total of 11:30. And if you want to push your film 3 stops beyond normal, then add another 5 minutes to the last time for a total of 16:30. If you want to pull your film 1 stop, subtract 2 minutes from your base time, for a total time in the First Developer of 4:30.

For fractions of a stop, just figure a fraction of the 2, 3 or 5 minutes that was added to the base time for First developer. In other words, if you want a quarter of a stop push process, then add just 30 seconds (1/4 of 2 minutes) to the standard first 6:30 developer time, for a total of 7:00.

Now all this information is useful for almost all E-6 films out there on the market, but it is worth noting two new films, one from Kodak, and the other from Fuji. Kodak's E-200 Chrome film is a remarkably pushable film. It hardly gains any contrast, graininess or color shift, all the way through a 3-stop push. Until now that was unheard-of. You can still follow the standard push and pull times outlined above when processing this film.

Fuji recently introduced Fujichrome MS 100/1000 Professional (RMS). This film can be shot at any speed from 100 to 1000 and also gives incredible results. But this Fuji film has its very own push chart. It is essentially the same through a 2-stop push, but then it begins to use shorter increases. For a 3-stop push, the additional time is only 3 minutes (instead of the 5 above). And for a 4-stop push, you add another 4 minutes for a total time of 18:30 based on our standard time. Remember, these instructions only apply to Fuji RMS, and we haven't had a chance to test it out completely yet.

Washes

In the past, we always said, the first wash was temperature critical, but the final wash didn't really matter. Well, once again, the newer technology films really test the limits of the standard E-6 process. With these new films, the final wash is also temperature critical, so it is best to make sure you wash your films every time at 100º F (38º C). Being off in your final wash temperature is not likely to show up as a color shift the way it does in the first wash. Instead it may result in a changed density due to a newer anti-halation layer.

Summary

Most of the items we have discussed here are not revolutionary changes to the good old familiar E-6 process. Most often it is just an improved self-discipline in how you run the process. As always, consistency is likely to be the single most important skill in processing. But following the directions accurately and avoiding customization, except to correct for speed, contrast or color balance, will get you the results you are looking for. Make your process consistent and reliable, and get creative in your camera work instead.

The Advantages of Rotary Processing

by Johannes Juergen Bockemuehl

(This article was written for the premier issue of the 'Journal of Rotary Processing' in 1984, and still holds true today!)

Rotary processing of photographic materials has been available for many years but few people know the advantages of rotary processing.

In the ‘early days’ of photography virtually every photographer processed his/her black and white work in their own darkroom. With the advent of the more sophisticated color materials, however, processing was mostly relegated to the specialist. These specialists, soon to become known as photofinishers, devoted all their time to managing the complicated processes required to develop color materials. The photographer was either not capable or simply did not have the time to be bothered with such complicated matters.

Today, though, it is possible to easily and economically process color materials "in-house." Many reasons for this change exist, including the advent of new "easy-to-use" chemical processes, and a proliferation of advanced darkroom devices. One of the primary changes, though, is the availability of small volume processors, almost all rotary.

While chemical manufacturers have made great strides in improving economy, stability, and ease of use of various processes, the fact still remains, top quality processing requires stable and repeatable temperature, agitation and timing. Even the latest "room-temperature" chemistries work best and produce repeatable results only if factors such as temperature and agitation are constant. Rotary processors provide the needed stability and repeatability at a price and size that make "in-house" processing practical for the average photographer. Another important chemical change has made rotary processing more attractive. Prior to the advent of Kodak’s E-6 process, rotary processing of reversal films was not possible. Processes such as the E-4 process did not produce acceptable results with rotary processors. Today, however, rotary processing of E-6 films produces quality transparencies equivalent to any other method of processing.

Small volume rotary processors offer many advantages to the photographer over other types of "in-house" processing or sending film out to commercial photofinishers. In the following paragraphs I intend to deal only with the advantages of rotary processing vs. other methods, such as "dip & dunk", for "in-house" processing.

One of the primary advantages of rotary processors is price. While rotary processors range from a simple motor base and drums up to sophisticated, dedicated processors, such as the JOBO AutoLab 2500, in general, rotary processors cost less than equivalent models utilizing other methods of processing.

The price advantage becomes even more pronounced when the ability to handle more than one process is required. Most processors, other than rotary, are dedicated to one process or at best require lengthy changeovers. Rotary processors, in contrast, handle numerous processes with minimal changeover requirements. There are even rotary processors simultaneously allowing instant change from one process to the other (ie, C-41 to E-6 or RA-4). This same versatility allows rotary processors to be quickly adapted to new processes as they become available while other types of processors often become obsolete or require expensive modifications.

Another price advantage of rotary processing is the small processing solution requirements. Each individual film or sheet of paper requires only a small amount of solution because the material does not have to be entirely submersed at all times. Also rotary processing normally requires only the amount of chemistry needed for the current processing needs. Other processors, such as roller transport machines, require large reservoirs regardless of the amount of processing to be done. Often the "in-house" user does not have the volume to sufficiently utilize the large amount of chemistry before it is out of date.

A secondary benefit of the small solution requirements of rotary processing comes in processing repeatability. Processors which require large reservoirs often require replenishment. Replenishment requires expensive monitoring equipment (ie, densitometers) and even then often does not provide totally repeatable results except with the finest technicians in control. Rotary processors, on the other hand, require such small amounts of chemistry that fresh chemistry can be used for each processing session. This eliminates the variability of replenishment rates, age of chemistry, square feet of film processed and the myriad other factors that can affect processing results.

The combination of "in-house" processing with small chemistry amounts provides another measure of control not afforded by processors requiring large reservoirs of chemistry. This is the ability to adjust the chemistry to correct for various factors.

For example, most professionals realize that E-6 compatible films vary in color response from one emulsion batch to the next. The variations may be small but to a professional they can make a large difference. One way to overcome these color shifts is the use of CC filters on the camera lens. This method requires the photographer to buy a large amount of film of one emulsion batch, determine the color characteristics of that batch, and then correct with the appropriate filters. This method , however, is doomed to failure if the lab doing the processing is not consistent. A simpler method of color correction can be achieved by altering the chemistry to suit a particular emulsion, however, this is impractical for the "in-house" lab if a processor requiring large amounts of chemistry is used. Rotary processors, on the other hand, are perfect for this type of correction because of their small chemistry requirements and the ability to quickly change from one chemistry to the next. The ability to adjust for these color shifts is greatly enhanced if corrections can be made quickly with small chemical amounts.

Versatility is another feature offered by rotary processors that no other type of processor can match. The ability to change quickly from one process to another has already been mentioned, but most rotary processors also allow processing of many different formats. For example, the JOBO AutoLab processor can process films from disc through 16x20" sheets and paper in sizes up to 20x24". Some processors even allow processing of multiple formats simultaneously, thus saving time and expense. The versatility of the rotary processor not only saves expense in equipment but also requires much less space than a combination of machines dedicated to individual processes. Obviously, the use of many machines dedicated to individual processes is

out of the question for the average photographer, but with a rotary processor all of these formats can be handled.

Throughout the previous discussion the term "repeatability" has been used. Many factors affect the ability to get consistent results over a period of time. Emulsion batches of film and paper, accuracy of enlarger color heads and color analyzers, and processing accuracy all affect the final result in processing. If any step of the photo process from exposure through development cannot be accurately repeated final results will also not be repeatable. The four main factors that affect processing repeatability are quality of chemistry, agitation, temperature, and time. Rotary processing can repeatedly provide all four necessary factors:

Consistency of processing is increased by using fresh chemistry each time as mentioned earlier. Agitation on rotary processors can easily be controlled with adjustable rotation speeds and streaking problems that can be caused by rotary agitation are virtually nonexistent if the direction of rotation is reversed periodically; a built-in feature of many rotary processors.

Temperature control in small rotary processor is usually done with warm air or warm water. The advantage of either method over processors requiring large reservoirs is speed. Many small rotary processors can be ready to process within an hour while larger processors require many hours to reach operating temperature and stabilize.

Timing is automatically controlled in many rotary processors: the JOBO AutoLabs even have a programmable microprocessor. The high degree of timing accuracy available in current processors effectively eliminates this variable from processing.

Two final advantages of rotary processors are size and ease of use. Most rotary processors are simple to operate, often needing only a plug, faucet and drain. Conversely, other types of processors often require expensive structural modifications and extensive operator training before they can be operated.

Obviously, rotary processing has many attractive advantages for the photographer and photo enthusiast.

To Soak or Not to Presoak

By Ken Owen

Recently, on the internet, we have seen questions regarding black and white (BW) rotary processing, particularly in regard to Kodak’s Xtol developer. Participants in the internet newsgroup rec.photo.darkroom are quick to point out that we at JOBO recommend that all conventional BW films should be processed using a 5 minute presoak, except for Xtol, but there seems to be a fair amount of confusion regarding the reasoning behind the presence or absence of a presoak.

The story goes all the way back to the earliest days of JOBO here in the USA, about 16 years ago. At that time we wanted to be able to provide a simple starting point for BW film processing. Yet, we knew that the constant agitation of the JOBO rotary processors was going to increase the contrast on any films processed in them. We began exhaustive testing in search of the elusive magic factor which would allow us to say "To process BW films, simply multiply your developing time by X, and your rotary processing will work perfectly."

When we found a factor on one film that worked well for a single developer, we then tried that film in other developers. We quickly discovered that the factor did not translate to many of the other developers. So we reversed our approach and tried different films in the same developer. Again, we quickly discovered that one factor would not work on many different films in the same developer.

Then after a year or two of frustration, one of the technical staff at JOBO Germany told us to try a five minute presoak in water. So we tested a wide variety of films and developers and the vast majority worked well simply following the normal hand-inversion instructions from the developer manufacturer, and preceding it with this five minute presoak. While some of the combinations of films and developers needed minor adjusting, nearly all the tested materials came within 5% of being right on target for delivering excellent results. We also tested shorter presoak times and found they did not work well at all.

So JOBO USA began recommending five minute presoaks for all BW developer and film combinations. Then about 1988 Kodak came out with T-Max films, and for the first time in our memory, a film manufacturer had included rotary developing instructions. Basically they had followed the same instructions we had discovered, and there was no need for any changes.

Then about three or four years ago, Kodak introduced Xtol developer. This time they not only had rotary processing instructions, they also had a whole instruction sheet dedicated just to rotary processing and for the first time in recent Kodak history, they gave instructions for other brands of film, as well as their own. But most importantly for JOBO, they indicated that all their developing times were for use without presoak. THIS is what caused all the discussion on the internet newsgroups. Why should Kodak advocate no presoak when JOBO advocates a presoak?

Go back to the history of the story, and the answer is clear. JOBO was looking for a SIMPLE way to get customers successful in their processing. The presoak provided that simple "common denominator" that enabled us to tell customers, "Presoak for five minutes then process normally."

What Kodak did was an enormous amount of testing, and published the results. Neither method is right or wrong. They both work well. If you are currently presoaking your film and getting the results you like, then keep on doing it. If you are starting without a presoak and you like the results, then keep on doing it. As I've said before, photography is not a pure science- it's really alchemy. Enjoy it.

Note: JOBO does not ordinarily recommend a presoak for color films since it may cause a slight color shift.

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