KEEPING PACE

A Monthly Newsletter Devoted to the Darkroom Arts

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Corrections For long Exposures

Reciprocity.
How does it affect the quality of the Cibachrome print?

We all know how slow the material is when compared to either Kodak's or Fuji's. Type C or Type R prints, and I know from experience that a 30 second exposure will produce a specific result in a Ciba print and 60 second exposure will produce a different result.
The reason for the dilemma is understandable.
The material is produced with more than three layers and color coatings in order to "excite" the three color sensitive layers of emulsion.

The three layers have their own specific ASA speeds and as a result, the material must be manufactured to a specific point in order to be able to make an accurate and color corrected print.

The three speeds are calculated so that a normal exposure time and color pack will produce a color print that can be considered "normal."

The fact that a color paper material can be produced to such an exact "point of no return" is absolutely amazing.

Here is the rub.
The Cibachrome (Ilfochrome if you must) is very slow. If you attempt to make prints with a diffusion type enlarger and use a 75 watt bulb as the light source, you had better not make prints larger than 8x10, especially if you use contrast masks. I always used a condenser enlarger just to be able to take advantage of the speed, although I would have much rather had used a diffusion system.
Here is what happens when the exposure is too long.
You make a test print at 30 seconds with a filter pack of 30M and 25Y and determine that the exposure is too short and the color balance needs .05 more magenta.
Remember, you are using an easel meter that will allow you to make a measurement and allow you to adjust the *f* stop so that you can get the same reading as you did before any filter changes were made. You also decide that you will increase the exposure to 60 seconds. So far, so good. You make the new exposure and process the print. Lo and behold, the color improvement did not occur as we wished and the density did not fully correct itself.
What happened?
From tests that I have made, it seems that the speed of the material slows down with a longer exposure and because of the longer exposure, the color balance is also affected. I decided to make a test in such a way

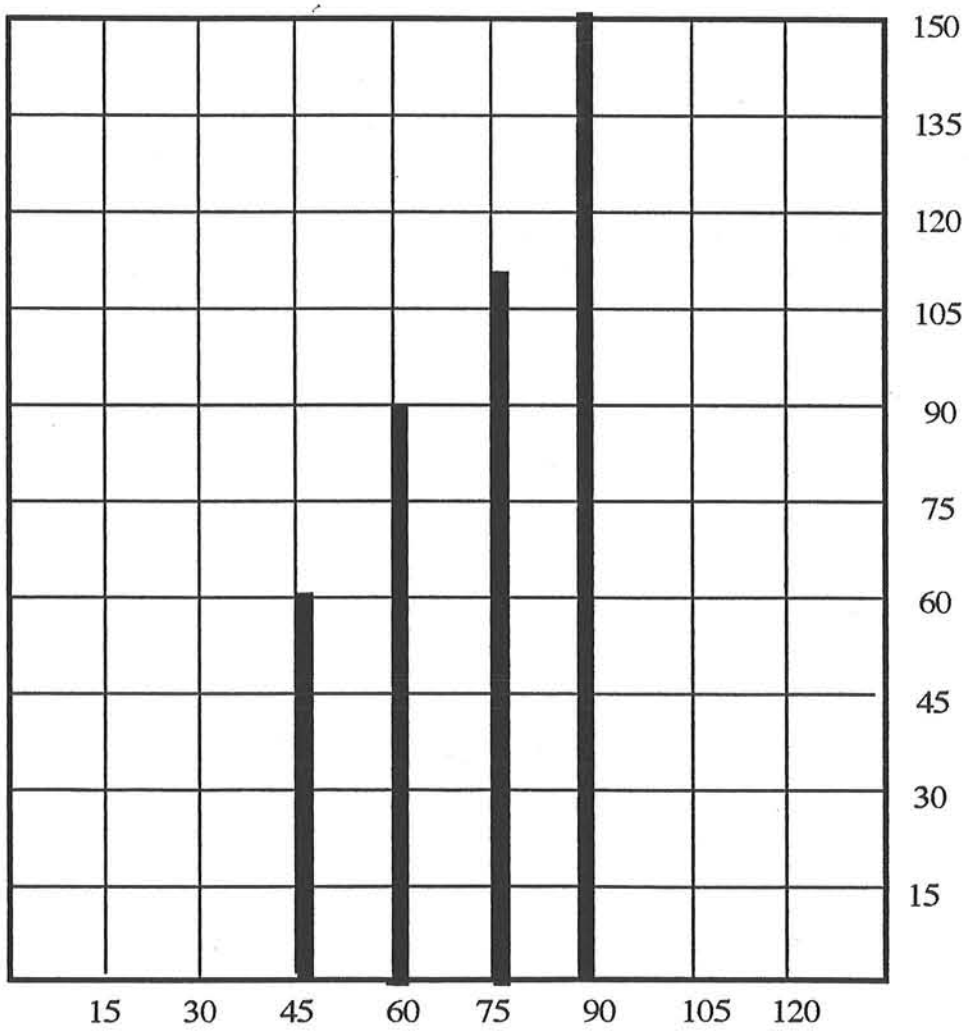
as to determine just what did occur.
I made a print by trial and error keeping my exposure at 30 seconds only and adjusting the density by use of the *f* stop. I used a specific color balance.
When I was satisfied by the results I then stopped down the *f* stop one full number. (From *f* 11 to *f* 16.) and doubled the exposure time. In black and white printing, this works accurately.
I re-exposed the image at 60 seconds but did not change the color filter pack.
The results were that the print was darker and needed more exposure and the print became more blue. It needed more yellow in the filter pack.
I also made a test with a 2 stop difference and increased the exposure 2 stops to 2 minutes. The results were much worse. The print was at least one *f* stop too dark and the filter pack was at least a 10 cyan too blue. This was an incredible change to accept. I decided to do something about it.

I know how to make charts that depicted the various changes in densities so I used a similar system to find the answers to my problem.

Testing was the answer.
I made a series of exposures from a transparency of a grey area (a wall) until I had a perfect print.

I then made a ring around set of prints in which I changed the color balance on each print and also increased the exposure on each print.
I began with 30 seconds and proceeded to 60 seconds, then to 90 seconds and finally to 120 seconds.
Many small prints of the same area were printed.
When processing was finished, I could look through the prints and find the one's that matched the original print as closely as possible.
When this was done I was able to construct a chart that looked like this. (show diagram)

As you can see by the diagram, the amount of correction (in my case) was dramatic. The color balance also drifted in a similar fashion. The longer the exposure the more yellow was needed to be added to the filter pack. Each enlarger will produce different, yet similar results. For a truly accurate demonstration with your own enlarger make a personal test and determine just what is needed in your own case. Condenser and diffusion systems will be quite different as will the color of the bulb and the color of the lens.



From this chart I was able to determine what exposure changes and density changes were necessary to get the correct results. It works.

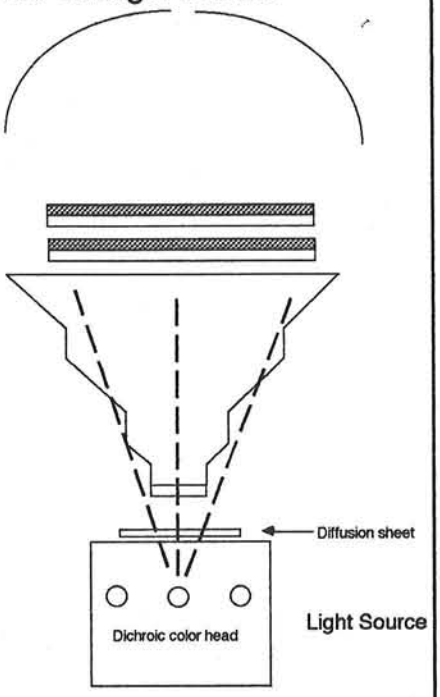
You too can experience the same degree of joy anytime it almost looks hopeless when a longer exposure is necessary.
If you have a slow enlarger light source this will always be a problem with Cibachrome. I have seen diffused light heads with as little as 80 watts of light. Hardly enough to expose a simple 8x10 b&w print. I have made remarks about the additive color heads that use three separate colored bulbs to produce the needed exposure. Sorry, but are too weak for Ciba. They are fine for Type C or Type R or any other process but Cibachrome printing.

Making the contrast mask.
What kind of exposing system can be used to produce contrast masks?

1. The enlarger.
2. An overhead diffused light source with filters.
3. An under the table light source with filters.
4. A variable light source using a rheostat.
5. A Waterhouse *f* stop system.
6. A vacuum platen.
7. A contact frame built into the table.
8. What kind (if any) provision is made for registration pins?
9. A copy camera with filters and a convenient light source for the transparencies.

Let us take each system, one at a time.

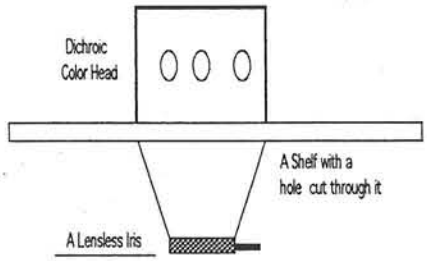
1. The enlarger.
Unfortunately, the speed required for exposing Pan Masking Film is quite high. If an enlarger is used as a light source, you will find the exposures needed at a low gamma of development will be extremely high. However, if you use the enlarger as a device to make a (fitted)) mask, then the use of the enlarger is fine.



Whenever registration is hard to achieve it may be the fault of the line of the image not falling in the right place.

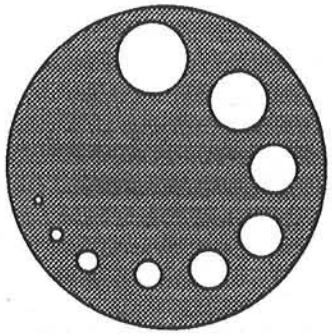
2. An overhead diffused light source.
If the light source uses a strong light bulb such as a #213 enlarging bulb, and provisions are made so that filters can be introduced in the light beam, this is fine. This will allow you to work on a table top and simply use a vacuum frame or a contact frame with registration pins. The only fly in the ointment here is that the bulb will be fixed in intensity. It would be better to have some method of reducing the light level without changing the color of the lamp A lensless Iris would work fine.

3. An under the table light source with filters.
To me this is the best ap

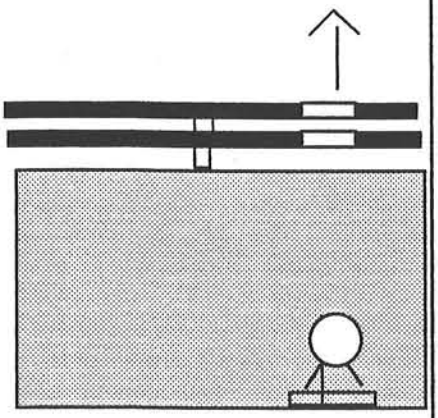


proach to making exposures for anything, whether it be a contrast mask, internegative, separation negative, Dupe Transparency, or any other form of exposing from an original piece of film. The beauty of this method is it's simplicity.
A box can be constructed as follows:
The filters can be placed on a slide arrangement or a wheel, and the intensity of the light source can be controlled by a second wheel or semicircular sheet with different size holes drilled into it.

These are known as Waterhouse ƒ stops, after the inventor. (sometime in the last century.)



The light sources for this box can again be a simple enlarging bulb (213) or a much sharper point light source using a special 20 volt, 100 watt bulb with a variable predetermined voltage that can easily be repeated.



By building a simple wooden box with a standard light bulb fixture screwed into the bottom and a #213 enlarging bulb screwed into it. Two circular sheets of wood or sheet metal with filters on one of them and Waterhouse F stops cut out of it will enable you to make accurate and repeatable exposures without any color balance change in the light source.

If you use a high intensity point light source it has one problem. It is so sharp, that marks on the glass or striations of the filament can be seen. The cure for this is diffusion (which kills the point light source effect) or moving the light source much further away from the film platen. The latter involves an overhead system with the light source somewhere down the hall and a series of mirrors directing the light path to the film plane. I know of some labs that used this approach. However it meant that all of the controls for changing filters and light levels had to be in the reach of the operator. If you don't mind spending money to achieve this kind of operation, fine. **K&M** light sources have such a system for you.

4. A variable light source using a rheostat.

The last paragraph indicates that such a system is available. Is it possible to build your own system? Of course it is. And without spending much money.

It is possible to purchase an electrical click stop 20 volt transformer at many electrical stores. Wire your light bulb socket and plug it in. You will find an absolute and repeatable voltage every time you click to a specific click stop. For making exposures on a varied amount of sources. You will need a 20 volt , 100 watt light bulb. The same kind of bulb supplied by K&M in their systems.

Remember, each time you change the voltage of any exposing bulb, the color balance of that particular bulb also changes. So, if you are all set to make masks at a specific voltage setting and accidentally set the voltage for a different voltage, the exposure will not only be wrong, but the balance between the exposures will be off a mile. It's like making one exposure at 3400K and another at 2800K. This is one very important reason to consider using Waterhouse ƒ stops. No matter what degree of intensity the light source delivers, the color balance will always be the same.

5. Waterhouse system.

Repeating something is a style that I like. It cements an idea that I think is valid and I don't mind repeating it Controlling the degree of brilliance of light is accomplished by a two methods. One is to reduce the voltage but as we now know, this distorts the color balance. the second way is to reduce the brilliance by cutting off some of the light with an obstacle. This Waterhouse gadget is actually a series of ƒ stops cut out of a sheet of film, or sheet metal. It can constructed as a slide system or in some sort of

wheel.
It is easily constructed. Local hardware stores sell an item that is attached to your electric drill and has a series of cutting devices that can cut a clean sharp hole into almost anything. The 6 or 8 hole cutters come in varying degrees of sizes from very small to 2 inches. This system can be made with simplicity for almost next to nothing.

6. Vacuum Platen.
The best method of achieving a tight fit between any two or more sheets of film is vacuum. Of course, pressure systems work but a tight vacuum works even better.
Professional platens can be purchased through companies such as Condit Mfg. They make the best. The platen can be used on a table with the light source from above, or a similar system can be built that allows the light from below. A special system can be made that works under the lens of an enlarger. The variations are many and they all work great.

7. Contact frames.
This is the least expensive method of producing tight fits between films. The frame can be inserted into a space on a work table thereby allowing the light source to be from below or from above the work bench. Contact frames are inexpensive and available from many sources. The critical element in the entire frame is the register pins that must be drilled and cemented into the glass. Condit can do this for you, as well as provide the entire frame. The choices are many. This method also eliminates the need for a vacuum pump and the electrical hook up it demands.

8. Register pins and punches.
This is the heart of the register system. Don't be fooled by the fact that some individuals have used a punch sold by stationery stores usually used for making holes in loose leaf paper The hole produced by these punched are too big and are not accurately positioned. The professional punch uses hardened pins that will last a lifetime and will accurately place the necessary holes in the correct place every time. **Carlson** makes punches for the lithographic field, and **Condit Mfg**. makes the best punches for the color printing field. Durst also makes a great punch that fits their carriers and it works fine, even if the price is rather high.
What make all of the corrections and masking systems work is an accurate punch and pin system. Don't waste your money on cheap substitutions

9. A Copy Camera with all of the provisions built in.
If you prefer, it is possible to make copies of your art work be it film or print using a camera for the entire process.
Suppose you have an 8x10 original transparency and you want to make a duplicate transparency or a set of separation negatives, a professional graphic arts camera can do the job with precision.
The mask can be shot with the camera locked in position using register pins and vacuum in the camera back. The mask can then be replaced over any other material being exposed by using the retractable pin system in the camera back. Oversized materials can be used with a second set of pins. The options can go on forever.
If you have a painting and require a set of separation negatives, then a Camera is the only correct way to provide the negatives. Making a transparency of the art and using that as the working piece is a mistake. The contrast level is too high and the color balance is also affected by the difference in the transparency films. I have made many sets of separation negatives from art work using a Brown Commodore 30x40 Graphic Arts Camera and have produced very accurate professional results. Think about the possibilities.
What I have described so far is not all that there is. There are more methods.

The next stage in this world of masking is digital. There are so many things that can be done with the computer that it boggles the mind.

Processing the delicate contrast masks made with Kodak's Pan Masking film.

Some of my readers have tried processing masks using a Jobo CPP-2 processor. Most claim that they get very accurate and repeatable results. However, a few discords have been heard.

Apparently little attention is given to the fact that pre-washing is mentioned as a method of obtaining smooth results. *Let me be very clear about this next group of words.*
If you want to make a mask, and decide to pre-wet the film, then how long must you pre-wet, and how long do you develop the film to make up for the fact that the developer must replace much water? Does the temperature of the water make a difference? How about the kind of water? Is it hard or soft?
The variables are so great and almost unending that I personally would not ever recommend pre-wetting any film, ever. Smoother results can be achieved by a better method insertion of the film into the developer and the proper rotation of the film through it's journey through the development stage. I don't know of anyone else that has made it a study as I have so that I could determine the exact amount of time it required to replace the water and to get a firm response of a gamma determination. It took a whole but I came up with some interesting data.

First, I processed a sheet of film for 4 minutes without regard to pre-wetting. After it was processed, I took readings of the high and low area so that a specific gamma could be determined. Then I pre-wet a sheet of film for exactly 1 minute and proceeded to process the sheet in the same strength developer. After 4 tests, it was determined that a 5 minute and 45 seconds processing time produced a similar gamma. Remember, I made sure that the temperature was on the nose and that my rate of agitation was the same. This was for one specific kind of film and fresh developer.
I tried the same procedure with a different kind of film and followed the same ritual and the gamma's did not match. I tried distilled water, and again, they did not match It was clear to me that the water had to be the same water.
So how can anyone say that pre-wetting is an approved method to produce smooth results?
The first time I called Jobo in Michigan, I was told that this method had the approval of their technical department. After I wrote a news]letter about this processing method, I was told that they no longer approved of it.

How do I suggest that processing masking film be achieved? First, let us show a tray method.

I fill my trays with enough chemistry so that I can actually float my film in the tray. I insert the sheet with much care, emulsion up, the carefully turn the film over and pull it through the developer and reinsert the film again, this time without turning it over. I rotate the film through the developer at a given rate of agitation. At one time I had my staff practice processing in a tray with the aid of a metronome. I would set the rate of 60 beats a minute and let the boys go through their efforts. It worked.
If you must use a rotary processor, I prefer the Jobo. The CCP-2 is ideal for this task. Use the Jobo tanks that come with the system (2523 or 2521.)

Load the film carefully so as not to scratch either side of the film. Any abrasions may appear in the final print, especially if a condenser light head is used.

I make sure that the film doesn't touch the bottom of the tray and I make sure that the film is inserted into the Jobo tank with much care. It takes a little time to develop a sense of delicacy. Imagine the problem if a mask is made by contact from a 35mm transparency (mounted into a larger sheet of 2-1/4 film) and the film is allowed to touch the bottom of the tray, the resultant abrasions would appear as railroad tracks in the background of the image. Disturbing? And how. A few of my readers are concerned by the fact that Kodak is pulling the plug on many of their films and manufactured items. The "Super XX" film that I grew with is going by the wayside.
My readers feel that Pan Masking film may be on their list. Some of the readers have tried to use "T Max" film and "Separation #1" film. Either of these two films are much too high in contrast to be able to achieve an accurate gamma determination. The Pan Masking film is the best thing that Kodak ever produced. I believe it was a fluke when it was made. At first the reason for the film's mushy and soft appearance was so that registration by hand and eye was easier to accomplish.

At one time, one of my competitors decided to use Kodak's Separation #1 film as a masking material. His reason for this was because he didn't like the flare that appeared around the outside of any light area on the image. It worked, but the developer had to be reduced to a state that it almost resembled water. I tried it too, and it worked fine, but I preferred the Pan Masking film.
The flare that appears around the outside of the light areas usually occurs when the mask is over exposed, or if the vacuum was too light.

The latest news from Dr. Patterson is very reassuring. The matrix film had a slight glitch in it's coating procedure and formula. A key technician at Kilborn Photo who was working on the matter suddenly had to stop work. His wife became seriously ill and he had to leave town. However, he has returned to work, and with the assistance of a top scientist at Kodak, the final bits of information about the emulsion and the yellow backing for the matrix film has been released. The information about the paper has also been released. A new yellow dye, as well as the familiar Kodak yellow dye has been developed. It does require a different retouching chemistry, and Dr. Patterson has persuaded Charles Carrosquillo of Los Angeles, a well known print retoucher and chemist, to play around with the retouching capabilities of the new yellow., and he already has this problem solved.
A mailing is being prepared so that we can find an approximate amount of people that are truly interested in the Dye Transfer Process.

With the rebirth of the Dye Transfer process about to be announced, new interest is developing quickly in the fine photographers field. As you all know by now, most photographers feel that the only way to get the kind print that they want is to make their own. This is a normal feeling. Some top notch photographers would rather have some one else do the work.
Some of the finest prints ever made in color have been made by the Dye Transfer process. During the years between 1947 and now, hundreds of thousands of Dye Transfer prints have been produced. Mostly for reproduction use in advertising but many have been produced for the fine art field.
I have been a part of this crazy world of color for quite some time. When I first began, all I could see was that there was color on a sheet of paper.
It took a while before I was aware of the subtleties that exist in the field of color printing.

Why highlight masks are needed when making Cibachrome prints?

If you believe that the problem with Cibachrome printing is the amount of contrast that the process has indicates that a method of reducing the overall contrast must be used.
The method that I recommend is contrast masking using a Pan Masking film. When using this film (or any other) the first area of complaint is in reproducing the highlight areas. The contrast masks will almost eliminate any fine details in the highlight areas because of the fact that the first place the mask hits is the highlight areas.
How do we go about restoring some of the specular details? We must make a highlight mask.

There are various methods of producing the needed highlight corrections. Two of them are all we should be interested in. If a highlight mask is made from the original by contact onto a sheet of Kodalith film, and exposed so that just a sliver of detail is evident (as a negative) and then if this sheet of film (after processing and drying) was placed back over the original, then the details would be restored. Not accurately, perhaps, but restored, never the less.

Another method is to make an exposure from the original by contact onto a sheet of reversal litho film which will reveal a black sheet of film with the highlight areas being clear. This one sheet is then used in the following fashion.
After the initial exposure on Cibachrome material, in the dark, the enlarger carrier is removed, and the contrast mask is removed and the new highlight mask (called a bump mask) is added to the pack and re-exposed. The addition of the new exposure will allow the highlights to suddenly "jump" out at you. This is a completely controllable method and produces a remarkable effect.

Another method of producing color in an otherwise drab image is done by using what I call "an Isolation masking system."
The reason for making color corrective masks is quite simple. A sometimes great image is spoiled because the color is too bland or perhaps too brilliant. The eye of the photographic artist must prevail. This unique ability is what separates the" men from the boys" to coin a phrase.

What can be accomplished by making color corrections? Many things. The green leaf can be changed ever so slightly so that the green doesn't become a beacon.

Making a flesh tone warmer or colder, depending on what kind of effect you are after, can make a difference in the portrait field. So can the colors in a fall scene, or the grey of a foggy morning on the ocean. It is in the eyes of the artist. Making a litho image using Pan litho film, you can isolate the different colors in a transparency. These chosen colors can be rendered clear.
Adding this one sheet of film back to the carrier can be used to further increase the exposure though a color filter to either increase or decrease the color it is affecting.
The final result will be worth the difference. If you have taste and understand what the word "garrish" means then you will be on your way to making better prints because you will be adding your own insight so the production of a print. Isn't this what Ansel Adams did?

What will happen if you go overboard? You will quickly join the ranks of the unknown. The worst thing you can do is to use color for color's sake.
Develop a taste for the right look. Good Luck

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