

Chapter 4 - Equipment

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Chapter 4 - Equipment

Notebooks

updated February 2001

To record the experience learned from many hours and years of platinum palladium printing, it is an excellent idea to keep a notebook of all printing activities. Two notebooks may even work better. One can be used to record all the information learned about the process and any tests that are performed. The other can be used to record all the information for producing each individual photograph.

Specific information to record for each negative or print include:

For Negatives:

Date photographed
Location and Subject
weather (optional)
Lens
Any other unique equipment
Film type
effective film speed (ASA)
Meter readings and range
Filter
Aperture
Shutter speed
Development (planned)
Development time (actual)
Developer concentration (actual)
Any other unique processing info

For Prints:

Negative Number
Date printed
Paper used
Chemistry used for coating
Sensitizer
Metals
Contrast Agents
Type of Drying (Wet or Dry)
Ambient Conditions
Temperature
Relative Humidity
Lamp distance or time of day
Exposure time
Burning and Dodging information
Developer
Clearing
Any other unique processing info

A convenient way to organize negatives and prints is to catalog them as follows.

For negatives: YYMMDD-XX

For Prints: YYMMDD-XX-PP

YY = year of negative exposure

MM = month of negative exposure

DD = day of negative exposure

XX = film holder number (assuming the same film holder is not reused the same day)

PP = print number

Each negative and print will have a unique number. It is important to keep track of the information for all prints, even those rejects that are destroyed. Information might be helpful in future endeavors.

Sample Film Data Record and Print Information Record:

Subject

Date

Location

#	Range	filter	f	S	N	lens	Development
							: @
							: @
							: @
							: @
							: @
							: @
							: @
							: @
							: @
							: @

Pt/Pd Print Information

Title / location

Negative #

Print #	Paper	Chemistry				Date yymmdd	Temp °F	Humidity % RH	Coating Drying D=dry W=wet	light distance (lamps) or time (sun)	Exp. Time min : sec	Dodge & Burn	Developer PO	Clear P20
		sensitizer mlSSS%	Pd mlX	Pt mlX	contrast agent %CC									
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														

Safe Light

updated February 2001

[Test For Fogging](#)

It is generally thought that the platinum palladium process may be carried out in subdued incandescent lighting. Although this may be true sometimes, it is easy for prints to be fogged, often without the knowledge of the printer. Due to fogging, the author switched from incandescent lamps to low wattage yellow bug lights, and then, due to fogging again, began using a Sodium vapor lamp. Plenty of illumination to see well and no fogging were the results. Some sodium vapor lamps include two sets of filters (yellow and red). Use only the yellow filters.

The most critical time for a safe light is during the coating procedure. The mixture seems to be more light sensitive when wet. Another time to be careful is in the developer and the first clearing bath. It is better to curtail viewing the print until the print is fully cleared than to risk fogging it.

Any work light should be evaluated by the Fogging Test and used only if it passes. A light is only considered "safe" when it passes the Fogging Test. A Fogging Test is described in Chapter 14.

Positioning the Lamp

The most important area for bright illumination is the coating area which can also be used for weighing and mixing sensitizer solutions. Walls and ceiling should be painted white. The Safe Lamp should be positioned near the coating area so that the light can reflect off the ceiling and provide enough light at the coating area to clearly read a newspaper. Some of the light will need to make its way to other parts of the work area such as the printing area and the sink area. The illumination in these areas should be enough so as to avoid tripping on or bumping into objects and enough to identify clearing baths and such. For large work areas, two safe lamps may be needed.

Measuring Equipment

updated May 2001

Solid Measure - Scale
Liquid Measure
Droppers
 Calibrating Droppers
Accessories

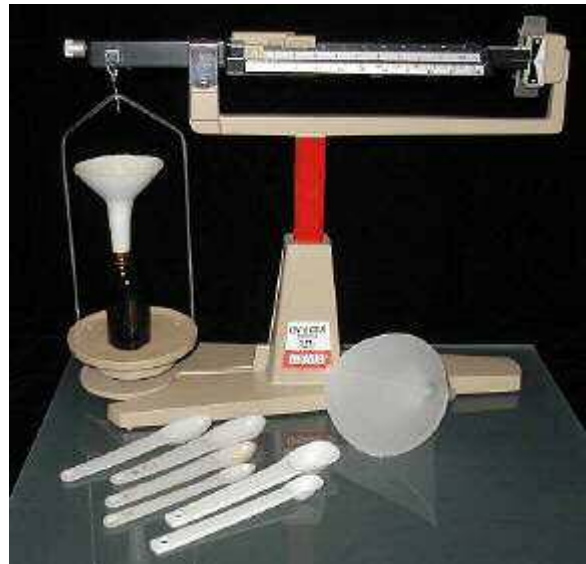
Measuring equipment only needs to be as accurate as necessary to maintain consistent results from the process. Chemicals for the coating solutions (sensitizer, metal salts, contrast agents, other) should be measured with an accuracy of 0.01 grams and 0.01 ml. Developers and clearing baths can be measured with an accuracy of 1 gram and 0.5 ounce (15 ml). Liquid film chemistry can be measured with an accuracy of 1 ml.

It is recommended to use only glass or plastic for measuring equipment and accessories. Metal should NOT contact any chemical as some metals (especially iron) can adversely hinder the process.

Solid Measure - Scale

Scale should be accurate to .01 gram
The Ohaus Cent-o-gram quad balance works fine.

Also shown are plastic spoons and funnels and glass or plastic sheet to catch spills.



Liquid Measure

10 ml medicine syringe (accurate to .1 ml) - 2
1 ml medicine syringe (accurate to .01 ml) - 1
100 ml graduate - (glass, accurate to 1 ml) - 1
50 ml graduate - (glass, accurate to 0.5 ml) - 1
32 oz glass measuring cup (accurate to 0.5 oz) - 2



Droppers

Droppers (with bottles) (all should be glass and calibrated as below) - 7+

Calibrating Droppers

Materials:

droppers (glass)

the small calibrated syringe (1 ml, accurate to .01 ml)

masking tape

chemical resistant epoxy paint

distilled water

Instructions to calibrate:

- ✓ determine the amount required to be dispensed
- ✓ fill syringe to desired amount with distilled water (distilled is used so as not to contaminate the dropper.)
- ✓ remove bulb from dropper
- ✓ placing finger over narrow end of dropper and holding with large end up, fill with measured syringe contents
- ✓ place masking tape on dropper so that edge is at the level of the water and the tape covers the dropper above the water level. (If a meniscus is seen, measure from the bottom of the meniscus.)
- ✓ release water from dropper
- ✓ mark a line on the dropper at the tape edge using the epoxy paint
- ✓ remove tape and let paint dry

Using:

- ✓ fill dropper with solution to above paint line
- ✓ then empty some solution so that the top of the solution is at the top of the paint line (If a meniscus is seen, measure from the bottom of the meniscus.)
- ✓ empty entire dropper into destination
- ✓ The delivery might be slightly less due to solution sticking to the dropper surface, but should be very consistent.

Accessories

Spatula or small spoons to handle dry chemicals (glass or plastic) - 3

Stirrer (plastic)

Funnels (plastic, with small end so as to fit on the 2 oz dropper bottles) - 2

plastic sheet - to catch spills when weighing out dry chemicals

appropriate personal safety equipment - glasses, mask, gloves



Storage Equipment

updated February 2001

General Coating Solutions Developers Clearing Baths Other

General

In general, the lab should provide storage for each of the hazard storage categories (see [Hazard Ratings and Storage Recommendations](#)). Also storage should help prevent cross contamination of materials. This can be accomplished with four areas.

Pt/Pd chemicals with BLUE and ORANGE storage recommendations:

The BLUE materials (which typically involves the Pt salt) may be stored with the Orange materials if the area is secured as a poison area would be. This should be a cabinet with lock if necessary used only for Pt/Pd materials, measuring equipment, and accessories.

Film chemicals with ORANGE storage recommendations:

This can be a separate cabinet or shelves for film chemistry and film processing equipment and accessories.

Chemicals with YELLOW storage recommendations:

These should be stored in a separate cabinet away from any flammable or combustible materials. This cabinet should be metal and may require ventilation for some materials.

Chemicals with WHITE storage recommendations:

These are typically acids which can be placed in a large plastic tray (to contain potential leaks) under the work sink so that possible fumes may be ventilated with the sink area.

Coating Solutions

- 1 oz Dropper Bottles (dark amber glass, with glass droppers) - 4+
- 2 oz Dropper Bottles (dark amber glass, with glass droppers) - 3
- Small Light Tight Box to hold the 2 oz dropper bottles containing sensitizer

Developers

- 32 oz Bottles (wide mouth, dark amber, glass, plastic lid) - 8 (2 minimum)

Clearing Baths

- 1 gal. bottle (wide mouth, plastic, for acids) - 3

Other

- boxes - to hold cut paper ready for coating
- light tight Bag - for brush storage
- shelves for accessories and miscellaneous equipment

Contact Printing Frame

updated May 2001



The contact printing frame holds the negative and coated substrate together for printing. It can allow viewing of the printout with out losing registration of the negative and paper. The old Century contact printing frames when modified work the best. To modify, all that is needed is to have two pieces of black vinyl and a piece of thin foam sheet cut to the interior size of the printing frame. One piece of the vinyl (placed next to the substrate) should have small tabs at each end to facilitate removal from the frame. The foam sheet should be thin and soft. Too rigid of a foam sheet will not work as well.

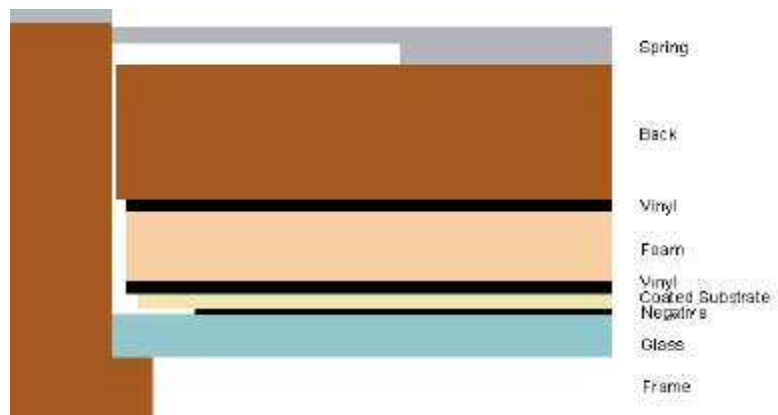
After placing the film and coated paper into the frame, add one of the vinyl sheets (with tabs), then add the foam sheet, then the second vinyl sheet, and finally the back. The black vinyl prevents reflections through the back of the paper and provides a humidity barrier and protects the foam sheet from wear. The foam sheet provides a good even hold down for assured contact and registration. The felt on those old Century contact printing frames just does not do what the foam sheet does. For ease of assembly, the foam sheet can be glued between the vinyl sheets to enable handling as one piece; however, only glue in a few places along one end so as to not restrict movement as the pieces are pressed together when closing the back.

It is also important to have a good piece of glass without visual defects. The glass should transmit ultra violet and blue light well as this is the light needed for exposure of the coating. The glass should be thick enough so as not to flex too much when the spring back is clamped shut.

Accessory Equipment:

- Cotton gloves For handling negatives
- razor blades, glass cleaner, and paper towels for cleaning glass

Diagram of loaded Contact Printing Frame (not to scale)



Light Source

updated May 2001

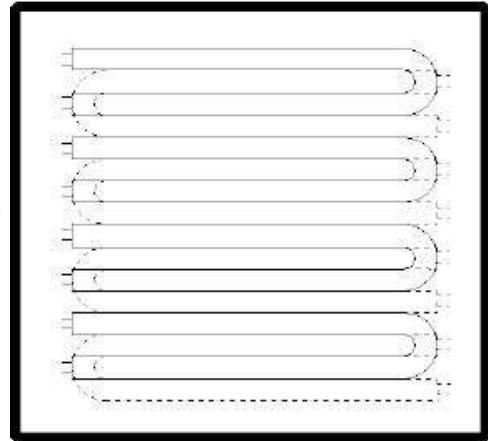
Sun
UV lamps
Additional Equipment
Sun vs UV Lamps

Sun:

The sun makes an excellent light source if weather conditions permit. Exposure can be in direct sun or in the shade with differing results. If in direct sun, a short stick mounted perpendicular to the Contact Printing Frame will indicate when the frame is aimed directly at the sun when no shadow is showing. Printing times may vary throughout the year as well as throughout the day. Most consistency can be kept by printing from 10:00 am through 2:00 pm. Logging the date and exposure in the Notebook can eventually provide information as to the need for any correction for the time of year. For more controlled light and printing at night or anytime, artificial lamps can be used.

UV Lamps:

There are many lamps available for use as UV sources. The most important aspect is to have uniform intensity in the exposure area. The best way to accomplish this is to have the illumination source the same size (or larger) as the exposure area. The long tube lamps work well for this purpose. Several straight tubes may be placed side by side to make whatever size area desirable. U-shaped tubular lamps may cost less overall, and should be mounted in two layers one offset above the other (see diagram at right).



Since the Pt/Pd coating is mostly sensitive to ultra violet and blue light, tubes should be chosen that have their maximum output in this part of the spectrum. These lamps may be designated "BL" or super actinic. It is not immediately obvious which lamp will have the highest output. These lamps are rated by wattage, and it is soon discovered that the higher the wattage the longer the tube. The highest output lamp can be found by dividing the wattage by the tube length, and then, comparing this number (the larger, the more powerful). The trick here is that what is needed is the power output per area. The tube diameter is usually small in comparison to its length, so using just the length will provide an accurate enough calculation. Catalogs readily list the wattage and length of tubes.

An excellent U-shaped lamp is the General Electric F40BL/U/3. Six can cover a 20 x 24 inch area at a distance of 12 inches (or even larger, 30" x 36" with good uniformity at a little further distance). When ordering the lamps make sure to get the proper ballast for the lamps. And, this is a good time to get the electrical sockets. This way everything should be compatible.

A wooden housing may be constructed for the lamps. If wood is used running a ground wire or grounded metal strip within proximity of each lamp will help assure proper starting. The inside of

the lamp housing should be painted with a highly reflective flat white paint. This will get more light to the working area. Do not use polished or metal reflectors as this will only cause non uniformity problems in the exposure area. The working area can be painted flat black. The housing should be light tight. A black cloth with 1" to 2" wide Velcro around the opening will make a good light seal and keep it easy to open and place the printing frame into the exposure area. The reason the exposure area should be light tight is so that the UV light will not interfere with other steps (such as clearing or coating) that may be occurring simultaneously in the same room. Having the exposure area in a separate room would be helpful especially when dodging on burning with the cloth open, but would require more movement from room to room.



For dodging and burning the cloth will have to be open. During that time make sure no other UV sensitive activities are occurring within proximity. Also protect eyes and skin whenever exposed to the light (see additional equipment below).

Additional Equipment:

Glasses that block all Ultra Violet light - These must be used when dodging, burning, or looking at lamps or the reflected UV light from lamps. Make sure the light is blocked from the sides of the glasses as well such as may be done with glacier glasses or goggles.

Gloves and long sleeves - These will be used when dodging or burning, it is easy to get a burn from working under UV lamps. Sun-block may be used, but wash it off hands and fingers to avoid getting any on the print.

Sun vs UV Lamps:

The following table lists and compares some of the differences between the sun and UV lamps.

Difference	Sun	UV Lamps
collimated light	yes - parallel and sharp	no - diffused
spectrum change	by atmospheric conditions	by lamp type
intensity	can vary by hour of day and time of year	fairly consistent
availability	partial	always
reliability	by chance	high
sharpness	high	depends on contact
temperature	may get very hot	cooler than sun
exposure times	typically several minutes	usually longer than sun
equipment cost	minimal (stand and shadow stick)	several hundred dollars
exposure control	by covering	by timer switch

Processing Equipment

updated February 2001

SINK

Large sink to contain all wet processing steps. 3x10 foot works well for 12x15 inch trays. In a large lab with heavy use, separate sinks for Pt/Pd and film may be beneficial.



TRAYS

Trays should be a bit larger than the largest paper to be used.

Note: 12x15 work fine for 11x14 paper and smaller (8x10 negatives and smaller).

Trays should be white plastic with smooth bottoms (no ridges or groves).

Note: Ridges or groves may damage the paper, especially thin paper.

- One tray used exclusively for Developer bath (labeled)
- One tray for rinse (labeled)
- Three trays for Clearing baths (labeled)
- One larger tray for pre-washing
- One larger tray (or print washer) for washing
- One tray for brightening (optional)
- Five trays for film (develop, stop, fix, hypo clear, pre-wash) (labeled)

Note: NEVER use any other chemicals, especially film chemistry, in the Pt/Pd trays. Staining of prints can occur.

Print washer

This is optional and only for heavier papers or fabric.

Drying Screens

These are a must for thin papers

Clips and Line

These are for drying heavier papers and fabrics.

Large Plastic Bucket

This is used for neutralizing acids.

Good Ventilation System