

Chapter 9 - Processing

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Chapter 9 - Processing

Developing

updated December 2000 and March 2005

The platinum palladium material actually develops as it is exposed to light and the subsequent chemical bath serves to enhance this affect. This is observed as the printout. However, two forms have been described as follows. POP (printing out process) achieves a complete development during the exposure and does not require further development. DOP (develop out process) achieves a partial printout and requires additional chemical enhancement development. Whether the process is POP or DOP is primarily a function of the sensitizer and other coating materials used.

The most commonly used developer is Potassium Oxalate. Developers may be used at various temperatures or with certain additives to produce various outcomes in the final print.

Ammonium Citrate is another developer, although it tends to produce a flat look by itself. A more neutral color (from this developer) can be achieved while maintaining the desirable qualities of Potassium Oxalate by mixing it 50-50 with Potassium Oxalate. Once mixed these developers seem to separate and should be shaken or re-mixed immediately prior to use.

Procedure:

- ✓ Place print, image side up, into the dry development tray.
- ✓ Pour developer bath over the print.

Notes: Pouring should be quick and even and completely cover the print.

If a dry-wet line is formed, it is likely to show in the print.

If the print is placed into a damp tray, the developer bath must be poured over the print before any moisture can soak into and through the print. If moisture does soak through a light blotchy area is likely to show in the print.

- ✓ The image appears very quickly. But, let it sit a while (about a minute) with occasional agitation.
- ✓ Lift by a corner and drain as much developer as practical.
- ✓ Print is ready for the pre-clearing rinse clearing.

Notes & Considerations

Important: The developer should be replaced at some point rather than continuously replenished. This was determined by the [Clearing Study](#) which found that a heavily used developer can cause fogging.

Be careful not to bend the paper, especially the thinner papers. This may produce a permanent crease in the print.

The image on paper is extremely susceptible to scratching when wet. Therefore, do not touch the image area and keep the print image side up in all trays.

Fabric is quite tough. The print will not be hurt by any physical action short of tearing it. Also, the print is very hard to scratch.

Disposal of Acid Developers

Spent acid developers should be poured into a large bucket containing some water and baking soda. Use enough backing soda to give a pH of 7. More water should then be added to dilute the waste. Neutralized and diluted waste can then be poured down the drain with more water.

Clearing Recommendations

updated 3/2005

[Test for Clearing](#)
[Clearing Study](#)

Clearing removes all ferric and ferrous compounds and all metal salts leaving only metallic platinum or palladium imbedded in the substrate fibers. Clearing platinum palladium prints completely has always been a concern. The traditional methods of clearing were not complete. Some discoveries have included:

- The traditional Hydrochloric acid bath may "bleach" the image (especially in the highlights) with most papers (especially the thicker ones requiring longer clearing times). Dick Arentz first addressed this by suggesting the use of Phosphoric acid clearing baths.
- A pre-clear water bath for 2 minutes will dramatically shorten clearing times (in most cases by about half). The author as well as several others independently discovered this pre-clear water bath.
- A new indicator helps to determine if clearing is complete. This indicator was introduced by John Melanson. (see the [Test for Clearing](#))
- The author's Clearing Study of 2001 found that the addition of Oxalic Acid and EDTA (CAS: 60-00-4) to the Ferric Oxalate sensitizer can dramatically improve clearing of any clearing agent.

General note:

If the print dries at any time before clearing is complete, further clearing may not be successful.

Current Clearing Recommendations:

In all cases:

Use a pre-clear water bath for 2 minutes.

When using Ferric Oxalate Sensitizer:

add 0.04% to 0.1% EDTA (CAS: 60-00-4) and
3% to 4% Oxalic Acid
to the sensitizer solution.

Notes: The use of too much EDTA can result in a "bleeding" of metal during processing. The actual amount can vary with different papers, so the smallest amount of EDTA to add to the sensitizer to assist with clearing should be determined for each paper.

In general Ammonium Ferric Oxalate coatings will clear in about half the time of Ferric Oxalate coatings without the additives. No study has yet been performed with additives to Ammonium Ferric Oxalate.

All water should be filtered to 0.5 microns. Particles in the water can scratch the print surface.

Continue to work in a safe light as the print will remain light sensitive until completely cleared.

Water high in iron may hinder the function of the clearing bath.

Following these recommendations almost any clearing agent can be used including water, although times may vary as per the Clearing Test. Refer to the sections on [Chemicals](#) and [Preparing the Stock Solutions](#) for various clearing Agents.

Clearing Procedure for all substrates using any clearing agent:

- ✓ [When the FO sensitizer is mixed] Add 0.4% EDTA (CAS: 60-00-4) and 3% Oxalic Acid to the sensitizer.
- ✓ [After development] Place print into a tray filled with tap water until most of the unused coating is dissolved (typically 2 minutes). If the print floats, place image side down making sure there are no air bubbles on the print surface.
- ✓ Lift the print from the rinse and drain (allow most liquid to drain from substrate).
- ✓ Place print into the first of three clearing baths.
- ✓ After a third of the total clearing time with occasional agitation, lift the print from the bath and drain. This is typically 3 to 5 minutes depending on the clearing agent used, the paper and the coating.
- ✓ Place the print into the second clearing bath for the second third of the clearing time.
- ✓ Lift the print from the bath and drain.
- ✓ Place the print into the third clearing bath for the final third of the clearing time.
- ✓ Lift the print from the bath and drain.
- ✓ Place the print into a tray of water for 5 minutes. (If acid clearing baths were used, some baking soda may be added to help neutralize the acidity.)
- ✓ Lift the print from the rinse and drain.
- ✓ The print is then washed in fresh, filtered water for another 5 minutes.

Notes: Washing neutralizes and removes the clearing solutions and is considered part of the clearing process.

The third clearing bath and second wash must be fresh. When the third clearing bath shows slight coloration (in normal white room light), move it to be used as the second clearing bath. Move the second clearing bath to be used as the first. Properly

dispose (see below) the first clearing bath when it shows a strong amount of coloration.

At the end of the work session, the second and third clearing baths may be stored in bottles and used as the first and second (respectively) clearing baths for next work session.

Thicker, stiffer papers or fabric may be placed in a print washer. This will actually wash them better. But, make sure that there is no residual negative chemistry in the washer or stains may result. Thin papers which might fold should be washed in a tray.

The image on paper is much more susceptible to scratching when wet. Therefore, do not touch the image area and keep the print image side up unless working with a paper that floats on the surface (see next note.)

Some papers float. If this is the case, place face down or use a cover in the print washer. If face down, check that no air bubbles are trapped on the paper surface.

Disposal of Acid Clearing Baths

Spent clearing baths should be poured into a large bucket with some baking soda. Use enough backing soda to give a pH of 7. Water should then be added to dilute the waste. Neutralized and diluted waste can then be poured down the drain with more water.

Drying

undated 3/2005

Drying Procedure:

- ✓ Lift from wash water, drain, and
- ✓ If a thin or fragile paper, place face up on a drying screen.
- ✓ If a strong paper or fabric, Hang by clips on a line.

Notes: The thicker papers will dry much better if hung.

Be careful not to bend paper, especially the thinner papers. This may produce a permanent crease in the print.

Drying may be accelerated with blowing warm, dry air.

Chapter 10 - Optional Processing

Brightening

updated December 2000

An optical brightening agent may be added to the paper. This can have the effect of changing a yellowish natural paper color to a neutral white color. This can be a way to achieve a brightness lacking in most papers.

What happens is that the brightening agent has the property that when subjected to UV light, it in turn reflects blue light. Even a tungsten bulb emits enough UV for the agent to function. However, it must be remembered that brightened prints can look different under different illuminations. It is important that the prints be evaluated in the same illumination in which they will be displayed.

To make a working solution:

- ✓ In tray pour 32 oz water (0.5 micron filtered tap water or distilled)
- ✓ Add 15 ml Sprint Print Brightening Converter
- ✓ Add 1 ml Kodak Photoflo
- ✓ Mix well.

Note: The solution should be made fresh for each session and not stored.

Procedure to Brighten a print:

- ✓ After a print is fully washed or after a finished dry print is completely soaked in water,
- ✓ Place print in tray of Brightening solution (above working solution).
- ✓ Agitate gently for 1 to 3 minutes (depending on amount of brightening).
- ✓ Dry

Note: If brightening is too intense or no longer desired, it may be washed out of the print. However, this may take ½ to 2 hours, and the paper may not hold up to this much more washing.