



[www.bostick-sullivan.com](http://www.bostick-sullivan.com)  
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## Wet Plate Collodion Kit

Thank you for purchasing this Wetplate Collodion kit by Bostick & Sullivan. These mixing instructions are meant to be a basic guide to working with Bostick & Sullivan Wetplate kits and in no way should be considered a working guide to the wetplate process. We recommend reading extensively on the process before attempting to make images, and recommend joining the excellent online forum at [www.collodion.com](http://www.collodion.com).

Free telephone tech support is available to all Bostick & Sullivan customers. Our experts have over 30 years of experience in antique, traditional and alternative process photography. Phone toll free 1-877-817-4320.

The Bostick & Sullivan Wetplate Collodion kit allows the artist to create Tintypes, Ambrotypes and Glass Negatives using a single Salted Collodion and Developer. We recommend starting with Tintypes on black aluminum and Ambrotypes on glass, then experimenting with Glass Negatives once you are comfortable with the work flow and nuances of the processes.

### **Safety Precautions Note:**

**The Wetplate Collodion process requires the use of potentially harmful or deadly chemicals and compounds. Proper clothing and laboratory safety gear are necessary to prevent injury.**

**Always work in a well ventilated space! Wetplate photography produces flammable vapors! Prolonged exposure to fumes may be harmful to your health! Do not store chemicals near a water heater or any other flame or pilot light. Store chemicals in a cool dry place.**

**For chemical emergencies contact Chemtrec: (US) (800) 424-9300 or (INT) (703)-587-3887**

**We recommend a beginning wetplate printer should be under the supervision of an**

## **experienced wetplate photographer.**

For your safety, when working with your Wetplate kit you should wear:

**Safety glasses or goggles**

**Lab coat or heavy apron**

**Short-sleeve shirt to prevent sleeves from contacting dangerous chemicals**

**Latex, Nitrile, or rubber gloves**

**Close-toed shoes**

**Gas Mask (optional)**

**Contact Bostick & Sullivan toll free (877) 817-4320 if you have questions about the proper handling, storage or usage of you Wetplate Collodion kit.**

**Contact your local waste management to discover how to properly dispose of your materials.**

### **Your Kit Contains:**

**Safety Glasses** - Wear these glasses throughout the entire wetplate process. Splashes from blinding chemicals can occur during preparation and mixing of chemicals, the making of the wetplates, and their subsequent development and processing.

**250ml Collodion, USP** - Pharmaceutical Grade Collodion. **CAUTION: Boils at 95°F**

**400ml Old Workhorse Bromo-Iodizer** - A combination of Cadmium Bromide, Ammonium Bromide and Potassium Iodide in a 50/50 Alcohol and Ether solution. **CAUTION: Boils at 95°F**

**1000ml (8x10 kit ) or 500ml (4x5 kit) 10% Silver Nitrate Solution** - A standard 1.08 specific gravity solution of Silver Nitrate for sensitizing the collodion-coated plate. Enough to fill a standard 8"x10" photo tray.

**1000ml Wetplate Developer** - The Bostick & Sullivan Wetplate Developer is a traditional Ferrous Sulfate formulation that can be used for both negative and positive development. Makes 2 liters of positive developer and 4 liters of negative developer.

**1000ml B&S Rapid Fixer** - A safe, non-toxic fixer for all silver-based films, papers and photographic processes. A safe and sane alternative to deadly cyanide-based fixers.

**250ml Sandarac Varnish** - An aromatic mixture of Gum Sandarac, 95% Grain Alcohol and steam distilled Oil of Lavender. Used to create a beautifully glossy and protective lacquer finish on the emulsion side of a finished plate.

**25ml 7% Nitric Acid** - Used in many photographic applications, wetplate artists use Nitric Acid to adjust the pH level of silver nitrate baths.

**25ml Amino Silane Subbing** - Increases the Salted Collodion's adhesion properties when shooting Ambrotypes and Glass Negatives.

**100g Calcium Carbonate** - Glass cleaner. Work A teaspoon into a 5x7 glass plate with a teaspoon of rubbing alcohol. Non-scratching abrasive action adds some bite to the glass.

**Alcohol Lamp** - Warm your plates, solutions or varnishes over the low, even flame produced by this simple alcohol lamp. Fill with high-proof grain alcohol or isopropyl alcohol from the drugstore.

**Hydrometer** - Measure the specific gravity of your silver nitrate solution with this high quality glass hydrometer.

**PH Strips** - pH testing strips and chart for measuring the acidity and alkalinity of solutions.

**Funnel** - A high quality 4.25" Paterson funnel.

**Amber Bottles** - For storing mixed solutions.

**1000ml 32 oz clear plastic bottle** – for mixing and storing

**100ml Graduated Cylinder** – for testing the gravity of the silver bath and aide im measuring out chemistry

## **Preparing Salted Collodion For Tintypes/Ambrotypes and Negatives**

From Your Kit You Need:

**Collodion, USP**

**Old Workhorse Bromo-Iodizer**

**500ml Empty Amber Glass Bottle**

If you're coating glass:

**Amino Silane Glass Subbing Additive**

Other supplies you need:

**Beaker** (Metal and plastic may be harmed by the solutions)

Mix Solutions in the Following Ratios:

<u>Collodion</u>	<u>Bromo-Iodizer</u>
25ml	40ml
50ml	80ml
125ml	200ml
250ml	400ml

If you're coating glass:

**Amino Silane:** Add 3 - 5 ml to 100 ml Salted Collodion to increase glass adhesion when shooting ambrotypes and negatives.

**Warning! These solutions contain Ether and Collodion. Avoid prolonged exposure to their fumes. Always work in a well ventilated area.**

### **Mixing**

Use the above chart for these instructions:

**Step 1.** Measure the desired amount of Collodion USP into a glass graduated cylinder.

**Step 2.** Pour the Collodion USP from the graduated cylinder to a clean, dry glass bottle. Mark this bottle with today's date for your own reference.

**Step 3.** Using the same graduate or beaker measure the appropriate quantity of Old Workhorse Bromo-Iodizer from the chart above.

**Step 4.** Pour the Bromo-Iodizer into the dated amber bottle. Cap the amber bottle tightly, then shake.

### **Pouring the Plate**

\*Before ordering plates, measure the inside of your plate holder to make sure you get plates cut to the right size. Most standard large format film holders when converted to a plate holder are going to hold smaller plates than it would film.

#### **For Glass Plates:**

You want to clean glass very well before you pour it. This helps with adhesion. Your kit includes Calcium Carbonate, which is used as a non-scratch abrasive for cleaning glass.

Sprinkle 'A teaspoon of calcium carbonate onto an 8"x10" glass plate. Add a teaspoon of rubbing alcohol, and work the carbonate into the glass. Rub both side of the glass well for about 30 seconds. Rinse with hot soapy water, then rinse with cool water until the plates are streak free. Dry the glass plate with a paper towel, then clean the emulsion side with a small amount of rubbing alcohol. Buff dry, then dust with a static free brush. Then continue as you would with a black aluminum plate and pour.

#### **For aluminum plates:**

All you need to do for aluminum plates before pouring is to make sure you peel the plastic layer off the black side of the plate.

#### **Pouring:**

There is no easy way to explain how to pour collodion onto a black aluminum or glass plate. In a way, pouring a plate is itself a kind of art form. We recommend scouring the web for videos of people pouring the plates to see how it's done.

However, here is a brief description:

Pour Collodion onto the plate . Use a generous amount. Surface tension will keep Collodion from dripping over the edge (usually).It's a good idea to pour over a tray or some kind of wide container to catch drips so they don't end up on the floor. Don't freak out if some spills, just keep going. Rock the Collodion from corner to corner, covering the whole plate then slowly drain off the extra back into your bottle of collodion. Once the extra has drained off, allow the excess solvents to evaporate. Use the table below as a guideline. Collodion is not light sensitive, so pouring the plates can be done under full room lighting.

Evaporation time:

4"x5" 30 seconds

5"x7" 45 seconds

8"x10" 60 seconds

12"x20" 75-90 seconds

#### **Aging**

Freshly mixed Salted Collodion from your Bostick & Sullivan kit is ready to use immediately. As it ages, it will change from a light yellow to a burgundy red. Exposure times and contrast will increase as the Old Workhorse ages. The changes are subtle, yet many artists prefer to use aged collodion. Our

experience has shown that proper lighting is the key to Wetplate photography, whether you are using fresh or aged collodion.

### **Clean up**

Fill used beakers and graduates with very hot tap water. As the vessel heats up, a thin layer of clear or milky collodion will float to the top. Rinse with more hot water after removing collodion “skin”. Wrap the collodion skin in a plastic bag, and place in your regular trash.

### **Storage**

Store mixed Salted Collodion solutions in the amber glass bottles supplied with your kit. Store in temperatures below 100F (38C). Keep bottles capped tightly, as the solutions will readily absorb water from the atmosphere.

### **Disposal**

Outdoors, away from buildings and animals, pour the unused salted Collodion solution in a shallow glass or ceramic dish for evaporation. Rinse the storage bottle with 50-100 ml of Isopropyl Alcohol, adding that solution to the dish. Allow the solution to evaporate for 24-48 hours. A brown or yellow crust of hard nitrocellulose will form in the dish. Wrap this crust in a plastic bag and discard with your regular trash.

The above method works well with smaller quantities of Collodion. Check with your local solid waste department or fire department for the proper disposal of large amounts of Collodion and Ether.

## **Preparing and Maintaining Silver Nitrate Bath**

The Silver Nitrate bath is arguably the single most important component of the Wetplate process, since a properly maintained Silver Nitrate bath will have a usable life of many years. It is important that the solution be systematically prepared for usage, and then constantly nursed so that it's properties remain stable.

From Your Kit You Need:

**Safety Glasses**

**Silver Nitrate 10% Solution**

**7% Nitric Acid**

**Plastic Dropper**

**pH Testing Strips**

**Funnel**

**Hydrometer**

**Warning! Nitric Acid fumes are extremely irritating to the eyes and lungs. We recommend using a respirator gas mask when working with this chemical.**

### **Adjusting and Testing pH**

Adding a small amount of Nitric Acid to a fresh Silver Nitrate bath will help extend the useable life by dozens of 8x10 plates. As contaminants from the salted collodion build up in the Silver Nitrate bath, the Nitric Acid will prevent them from creating unwanted Silver compounds that can fog the image.

To 1000ml Silver Nitrate 10% Solution add:  
16 drops Nitric Acid 7%

Before sensitizing plates in the Silver Nitrate 10% Solution for the first time, you need to make sure the pH is within acceptable limits. Using the pH test strips from your kit, test the pH of the Silver Nitrate 10% solution. Typically, a new Silver Nitrate bath will be in the pH 3 to 5 range.

For maintenance, test the pH of your Silver Nitrate after 30-40 8"x10" plates. Our experience shows that the pH should remain fairly constant around pH 4 even after making sixty or seventy 8"x10" plates.

### **Measure Specific Gravity**

Knowing the gravity helps you to maintain your silver bath. A "fresh" bath will be 1.08, while a good working bath can measure as low as 1.04. If the Specific Gravity is lower than 1.04 you would need to add Silver Nitrate crystals to the bath. It's good to know the standard for your silver bath so you can maintain it well.

Pour 50ml of your Silver Nitrate Bath into a tall 100ml graduated cylinder. Lower the Hydrometer into the graduated cylinder. Add more Silver solution until the Hydrometer begins to float. Read the scale on the side of the hydrometer, noting the number where the Hydrometer passes through the surface of the solution. Record this number, and use it as a future reference as your "standard" solution of Silver Nitrate.

### **Filter The Silver Nitrate on a Regular Basis**

After adjusting the pH and iodizing the Silver Nitrate bath you must filter the solution before it can be used. Use a coffee filter in a funnel to catch any small particles that might cause comets and streaks on your images.

### **Clean Up**

Clean funnel and graduate with plenty of water.

### **Maintaining Silver Nitrate Bath**

Periodically the Silver Nitrate bath must be tested and adjusted to maintain consistent properties. As you sensitize plates, Collodion, Ether, Alcohol and other contaminants will build up in the Silver Nitrate Bath. A simple procedure will help remove foreign substances and help keep a properly maintained Silver Nitrate bath working for years.

Typically, you can make 100-125 8"x10" plates in a 1000 ml Silver Nitrate bath before performing maintenance.

First, we must remove any alcohol or ether that has built up in the Silver Nitrate while sensitizing plates. There are two methods, Sunning and Boiling.

**Sunning Silver Nitrate-** Pour the Silver Nitrate bath into an open widemouth container, preferably a clear glass beaker. Place in bright, direct sunlight for 48 - 72 hours. Make a note of the amount of silver nitrate solution you have before you sun your silver. This will be important to know later.

**Prevent animals and children from coming in contact with Silver Nitrate and all**

## other chemicals during this time!

Let as much solution evaporate as possible. Don't worry if dust gets in the Silver bath, it will turn black and settle to the bottom.

After sunning for a few days, add cool distilled or deionized water to the Silver bath to replace the solution that has evaporated. A green/blue plume will form as iodides and bromides are forced out of solution. You will have a bluish colored solution with black bits floating around. This is good!

Filter this solution using a paper coffee filter placed in a funnel. You will capture a portion of the iodides and bromides, as well as all of the black particles. Check the pH and Specific Gravity and adjust as necessary.

**Boiling Silver Nitrate** - If you have access to a scientific hotplate and glassware, boiling the Silver Nitrate solution can be a highly effective way to remove the Alcohol and Ether.

Set your hotplate to Medium-High with the Silver Nitrate in a beaker holding at least twice its volume. Add a few boiling granules if you have them. As the solution heats up, tiny bubbles will form, and the solution will boil very gently as it approaches 185F. The Alcohol and Ether are being driven off at this lower temperature, but as the solution nears 200F the smaller bubbles turn to a larger rolling boil.

Let the solution reach full boiling temperature for at least 15 minutes. Remove from heat and let the solution return to room temperature.

Check pH and Specific Gravity and adjust as needed.

**Test the Specific Gravity** – This is where you'll need the number you recorded when you measured the gravity of the silver bath when you first opened your kit. After sunning and filtering the Silver Nitrate bath, measure the specific gravity using the hydrometer supplied with your kit. A “fresh” bath will be 1.08, while a good working bath can measure as low as 1.04.

If the Specific Gravity is lower than 1.04 you must add Silver Nitrate crystals to the bath. Slowly add Silver Nitrate crystals to the bath a few grams at a time, and mix to completely dissolve. Re-test the Specific Gravity each time, and stop when it reaches 1.06 to 1.07.

**Test pH** - Take a baseline reading of the pH using a pH strip or electronic meter. Follow the “Adjusting pH” instructions above to bring the Silver Nitrate bath to a range of pH 4-5 using Nitric Acid.

Your Silver Nitrate bath will provide years of use if you maintain it properly!

## Developer

The Wetplate Developer shipped with your Bostick & Sullivan kit uses the classic Ferrous Sulfate formula in a concentrated form. We've tweaked the formula based on our own testing and have found that it makes great Tintypes, Ambrotypes and Glass Negatives.

**For Tintypes and Ambrotypes:**

Mix 1 part Wetplate Developer with 3 parts water.

Develop your plates for 20-30 seconds. Develop for longer if you need to pull up shadow details. Our developer has a restrainer added to it so it's hard to over develop at a 1:3 dilution.

**For Glass Negatives:**

Mix 1 part Wetplate Developer with 5 parts water.

Over expose your ambrotype by 3 stops (multiply normal exposure by 8x), then develop for 2 minutes. Develop in a tray and cover the plate completely. Agitate every 15 seconds.

**These dilutions are a basic guideline, and you may find that you prefer a weaker or stronger developer.**

**Fixer**

Many fixers have been tried and used with Wetplate images. Bostick & Sullivan recommends a safe Rapid Fixer. We provide an ammonium thiosulfate fixer with our kits.

**Standard Fixer Formula:**

250 ml Rapid Fixer concentrate 750 ml Water

1000 ml of working-strength rapid fixer is good for approximately 75 - 100 8"x10" sized plates.

Fix your plates for 4 - 5 minutes. Wash with cool water for 5-7 minutes.

Store used Fixer in the clear 1000 ml 32oz bottle that came with your kit. A yellow precipitate will form in the fixer after 15 - 20 8"x10" plates. This precipitate is harmless to the plates, but can be filtered out using a paper coffee filter.

**Varnishing:**

Your kit includes an aromatic varnish made from the sap of the Tetraclinis Articulata. This varnish will leave a lustrous, glossy, and protective finish on your plates.

**Warning!! Sandarac Varnish is Highly Flammable!**

**Warm the solution** - Place a bottle of Sandarac Varnish into a hot water bath to warm to approximately 110°F.

**Light alcohol lamp** - Fill the lamp with denatured alcohol or a high proof grain alcohol. and light the wick. Let the flame stabilize, then begin warming your plate by moving the back side of the plate quickly in a circular motion over the flame. Hold the plate on the edges, 2 - 3 inches from the flame, moving it around to evenly heat it. Be careful! Glass and aluminum get hot! We suggest wearing gloves while doing this to protect your hands from heat and to keep the varnish off your hands.

**Away from the flame**, quickly pour a generous amount of Sandarac Varnish onto the plate covering the entire surface, like you were flowing salted collodion. Let the Sandarac sit on the plate for a few

seconds before pouring it off. This will help it give a more even coating.

**Pour the Sandarac off** of one corner back into your container of varnish, keeping the plate vertical the entire time. After the Sandarac has drained for 15-20 seconds, break the bead on the edge of the plate with a paper towel. This is necessary to keep the varnish flowing to get a glossy finish without unevenness.

**Baking the Varnish-** after you've broken the bead of the varnish on the paper towel, hold the plate by the edges, varnish side up, and slowly bake the varnish by moving the plate over the flame the way you did to heat up the plate. Do this until you see thin wisps of smokes coming off of the plate. This is the alcohol baking away. This shouldn't take longer than 1 1/2-2 minutes. Set the plate to dry in an as dust free place as possible. The varnish will be dry enough to move around after an hour or so. But it will take a least a week before the varnish is fully hardened. Do not touch the surface or frame it with glass until that time is up. After that week, your plate will be safe to touch and safe from scratches.

**WARNING! While baking the varnished plate, try not to let the varnish touch the flame. If it does, it may catch fire! If your plate does catch fire, just blow it out quickly. Your plate will be fine.**

## **From Start to Finish**

### Basic Wet Plate Collodion Procedure

1. Prepare the plate.
2. Pour the plate.
3. Let evaporate. (Use the chart in the pouring the plate section)
4. Gently place the Collodion-covered plate into your silver bath dip tank. Insert the plate dunker into the tank quickly, so there will be no hesitation lines visible in the emulsion. Immediately cover the Silver Nitrate tank with its lid, or turn off the overhead lights. Yellow and red safelights are OK from this point on. Allow the plate to sensitize for 3-5 minutes.
5. Remove plate from Silver Nitrate bath. Allow excess Silver Nitrate solution to drain from one corner for 30-45 seconds. Use a paper towel to wipe extra solution from the back of the plate to help prevent cross contamination inside the camera plate holder.
6. Expose your plate. Exposure times vary greatly. In bright sunlight we find that exposures are in the 1-2 second range at f8 or f11, depending on the subject matter.
7. Develop your plate. At 68 degrees Fahrenheit you should develop for 40-60 seconds depending on your exposure and subject matter.
8. Wash the plate for 45-60 seconds with steady flowing cold water.
9. Fix plate for 5-7 minutes using liquid Rapid Fixer at a 1:3 dilution.
10. Wash the plate for 3-5 minutes then dry on a clean screen.

## 11. Varnish