

**USING THE REDUCER**

Reduction is carried out in daylight. The negative must be thoroughly fixed and washed. Pre-soak the negative in chloride-free water just before placing it in the working solution.

Place the working solution in a white tray. In a separate tray, place the after bath solution (solution C).

Immerse the negative in the working solution and agitate gently. When the reduction has proceeded far enough, transfer to the after bath (solution C) in the second tray. Any brown stain (manganese dioxide) will be removed in Solution C. The negative should remain a few minutes in Solution C, then washed thoroughly, and finally dried.

The time required for reduction varies. Usually 2-3 minutes will be required. However, occasionally the reduction is very rapid; occasionally it is very slow; and occasionally it is very slow at the start of the reduction but speeds up as the reduction proceeds. Close attention is necessary.



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**FORMULARY REDUCER III FOR NEGATIVES**

**1-liter kit**

Reducer III is similar to Gevaert GR-3 and is a proportional reducer that removes silver density from a negative in approximately the same amount as it exists in the negative. The final result of the reduction is as if the film had less original development. In this respect, the action of Reducer III can be thought of as film development in reverse. To make the working solution the chemicals in this kit are two stock solutions, which are then combined.

One of the stock solutions (Solution A) contains potassium permanganate and the other solution (Solution B) contains ammonium persulfate. Potassium permanganate is a proportional reducer (removes silver in proportion to its density) and the ammonium persulfate is a super-proportional reducer (removes more silver from the dense areas than from the faint areas). Therefore, the relative volumes of the two stock solutions, A and B, which you combine to obtain a specific working solution, depend upon the negative to be reduced. Typically, both equal parts of Stock Solutions A and B or one part of Stock Solution A to three parts of stock solution B are used. The choice must be based upon experience.

Using a reducer correctly is an art. We strongly urge you to practice with this reducer using scrap negatives before attempting reduction of a negative of value.

**CHEMICALS CONTAINED IN THIS KIT**

Your kit contains the following chemicals:

Chemical	Amount
Potassium permanganate	0.25 g
Sulfuric acid, 48%	3 ml
Ammonium persulfate	25 g
Sodium metabisulfite	10 g



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## CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning on each package. This kit contains three chemicals that require special attention: Sulfuric acid, ammonium persulfate, and potassium permanganate.

Sulfuric acid, 48%: Sulfuric acid, even at 48% strength, is a strong acid. If you should spill the acid, wash the area (or skin or clothing) immediately with copious amounts of cold water followed by soap and water. Neutralization of spilled acid with alkali is no longer a recommended clean-up procedure.

Ammonium Persulfate and Potassium Persulfate are both oxidizers. They can supply oxygen to any combustible compound thus, are potential fire hazards. Always clean up any spilled oxidizer with lots of water. Never dispose of excess solid oxidizer in a wastepaper basket - rather, wash it down a sink drain with water. The user assumes all risks upon accepting these chemicals.

IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS FOR A FULL REFUND.

Please consult with local sewer and water authorities regarding the proper disposal of darkroom chemicals in your area.

## MIXING THE SOLUTIONS

You will need three 1-liter containers for storage and a mixing bowl to prepare the solutions. You will also need a graduated cylinder or other volume-measuring device.

The action of ammonium persulfate is retarded by chloride ions. We recommend the use of distilled water especially if your water is softened or chlorinated.

### Stock Solution A

Chemical	Amount
Distilled water	750 ml
Potassium permanganate	0.25 g
Sulfuric acid, 48%	3 ml
Distilled water to make	1000 ml

Place the water in a mixing bowl and add the potassium permanganate. Be sure that all the purple crystals of the permanganate are transferred from the plastic bag to your container. If necessary, use a little water to wash out any trapped crystals.

It is necessary to dissolve all of the permanganate before proceeding. After a small amount of the permanganate has dissolved, the solution turns dark purple and the residual crystals are very difficult to see. Therefore let the container stand for about one-half hour. Occasionally stir the solution during this period to mix the solution. At the end of this period, you can assume that all the permanganate has dissolved.

Add all of the 48% sulfuric acid contained in the kit-vial to the solution then add additional water to bring the final amount of the solution up to 1000 ml. Finally, stir the solution to ensure it is homogeneous and transfer it to a storage container.

### Stock Solution B

Chemical	Amount
Distilled water	1000 ml
Ammonium persulfate	25 g

Place the water in a mixing bowl and add the solid. Stir the solution to dissolve the solid. Add water to bring the final volume of the solution up to 1000 ml. Stir the solution to mix. Stir the solution to ensure it is homogeneous then transfer it to a storage container.

### Solution C (the afterbath)

Chemical	Amount
Distilled water (20° C/68° F)	1000 ml
Sodium metabisulfite	10 g

Prepare the solution using the same procedure as described for Solution B.

## WORKING SOLUTION

To prepare the working solution, mix equal volumes 1 part A to 1 part B. Other dilutions also are usable. Mix only enough working solution for a single session since the solution must be discarded after use.

## LIFE OF THE SOLUTIONS

The shelf life of the stock solutions is in excess of 6 months. The working solution is unstable and must be discarded after a working session.