

# USING A PUMP SPRAY SILVER KIT

A mirror is made by depositing a thin layer of metal on a clean, sensitized, high gloss surface – either glass or plastic. With our Pump Spray Silver Kit, you can spray silver using muscle power instead of an electrically powered air compressor. The system is light-weight, portable and good for the environment.

**MIRRORING IS A CHEMICAL PROCESS. THESE PROCEDURES ARE *IMPORTANT*.**

- **Cleanliness** - The glass must be absolutely clean, including the edges.
- **Gloves** - Wear gloves to keep your hands and the glass separate.
- **Careful measurements** - Be careful but not fanatical with measurements.
- **Distilled Water** - Always use steam distilled or de-ionized water. The minerals in tap water or any other type of bottled water will ruin the mirror.
- **Timing** - Use a clock or timer to time the tinning and silvering steps.
- **Concentration** - Arrange your time so you can work without interruption.

## SAFETY

- **Storage** - Store the chemicals in a cool, dark place away from children and pets.
- **Staining** - The silver creates brown stains. Wear rubber gloves and cover your bench with several layers of newspaper. Silver Remover removes silver stains from skin and clothes.
- **Fumes** - Silver chemicals contain ammonia. We have respirators designed for ammonia and formaldehyde fumes.
- **Disposal** - These chemicals contain heavy metals. Follow the instructions in your Waste Treatment Kit to keep heavy metals out of the public sewer system.

## YOU SUPPLY

- A tray to catch waste chemicals (see our instructions)
- Supports to hold the glass
- The glass to be mirrored
- A few gallons of distilled or deionized water
- 2 plastic buckets for waste treatment
- A timer or a clock with a second hand

The tubes that connect the wand to the bottles are 3 feet (0.9 meters) long. To silver large objects, place the bottles and the wand in our belt Pouch for Pump Spray Assembly #A3565 and attach it to your belt. The Pouch is available separately.

## **MIRRORING TRAY AND GLASS SUPPORTS**

This kit is designed to silver a wide variety of shapes and sizes so it does not include supports to hold the glass or a tray to catch the mirroring run-off.

Use a clean tray that is large enough to catch all of the run-off including the rinse water. Use strong, sturdy supports to hold the object you want to mirror at least 1" above the level of the waste chemicals that will accumulate in the tray. For this project we used our Bench Kit #A1004.

## **PROTECTING THE SILVER**

This kit does not include a way to protect the silver. You must protect the silver with backing paint or lacquer. Use Clear Uni-Coat for front surface or 'spray chrome' applications.

## **CONNECTING THE BOTTLES**

Always connect the Silver bottle to the wand labeled "S" and the Reducer bottle to the wand labeled "R". If you mix up the bottles, silver will form inside the hoses and clog the wands. You can clean them out with Silver Remover if you need to. Flush the bottles, hoses and wands with distilled water after cleaning.

## **PUMPING THE BOTTLES**

You must spray on equal amounts of Silver and Reducer to get a good silver surface. To get an equal spray, the bottles must be fully pressurized. Pump each bottle until you feel firm resistance – until you cannot push the plunger more than half-way down the rod without forcing it. Do NOT force the pump.

Re-pump both bottles before you begin each new piece. Keeping the bottles fully pumped up is the key to getting a good silver deposit. The maximum liquid capacity for each bottle is 500ml. You must leave space in the bottle for the pressurized air.

## **RELEASING THE PRESSURE**

Release the pressure in both bottles at the end of every day to preserve the air and water seals. Hold the blue top firmly in one hand and unscrew the white bottle with the other hand until all the compressed air has escaped.

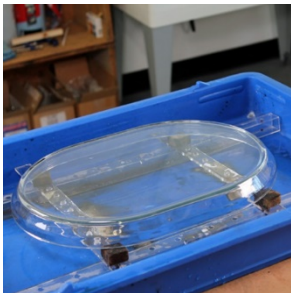
## **SHELF LIFE OF MIXED CHEMICALS**

Diluted Sensitizer has a shelf life of 6 to 8 hours. Diluted Silver and Reducer have a shelf life of 3 to 5 days. Diluted Wetting Agent lasts indefinitely. Freshly mixed chemicals work best.

## **MEASURING CYLINDERS**

This kit includes three (3) 25 ml measuring cylinders. Use 1 cylinder per chemical to avoid cross contamination. Label each cylinder with a felt tip pen – "S" for Silver Solution, "R" for Silver Reducer and "W" for Wetting Agent.

## STEP 1 – SET UP YOUR SPRAYING AREA



1. Set up a silvering area that is suitable for the size of the object you want to silver.
2. Support the object in a way that keeps it above the level of any waste chemicals that accumulate.
3. Make sure that you can easily reach the object from all sides.
4. Be aware of overspray. Mirroring is a very wet process.

## STEP 2 – MEASURE AND MIX THE SILVER AND REDUCER CHEMICALS



1. To open the bottle, hold the blue top and turn the white bottle to avoid twisting the hoses.
2. Measure out **15 ml** of 2-Part Silver Solution and pour it into the Silver Solution bottle.
3. Measure out **485 ml** of distilled water and pour it into the Silver Solution bottle.
4. Close the bottle tight and rock it gently to mix the chemicals.

Repeat this process to measure and mix the Reducer.

## STEP 3 - MEASURE AND MIX THE SENSITIZER



1. Measure out 250 ml of distilled water and pour it into the Sensitizer trigger spray bottle.
2. Use the syringe included with the Sensitizer to measure out 0.5 ml of concentrated Sensitizer.
3. Add the Sensitizer to the distilled water. Rock to mix.

*Mix up fresh Sensitizer every day.*

## STEP 4 – MEASURE AND MIX THE WETTING AGENT



1. Measure 20 ml of Wetting Agent.
2. Pour it into the Wetting Agent trigger spray bottle.
3. Add 200 ml of distilled water.
4. Rock the bottle to mix.

Diluted Wetting Agent has an indefinite shelf life.

## STEP 5 – PUMP UP THE SILVER AND REDUCER BOTTLES



1. Grasp the bottle firmly and pump the plunger until you cannot press the plunger more than half-way down.
2. Be sure to pump up both bottles equally.
3. Do not over pump.

## STEP 6 – CLEAN THE GLASS



1. Clean the glass very thoroughly with concentrated Glass Cleaner and hot tap water.
2. **Rinse the glass thoroughly** with distilled water to remove all traces of tap water.

*A perfectly clean surface is **essential** for successful silvering.*

Old flat glass may require polishing with Cerium Oxide and a Maple Felt Polisher. Refer to [How to Silver Sheet Glass](#). These supplies are available separately.

## STEP 7 – SPRAY ON WETTING AGENT



1. Spray the surface all over with diluted Wetting Agent.
2. Do NOT rinse off the Wetting Agent before you apply the Sensitizer.

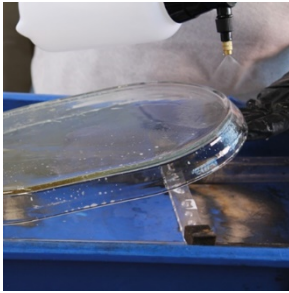
Wetting Agent is not necessary if you are silvering glass. It is very important if you are silvering plastic.

## STEP 8 - SPRAY ON SENSITIZER



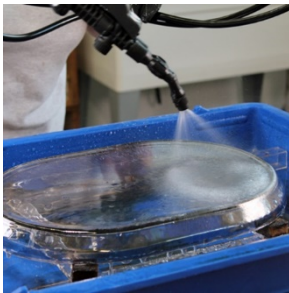
1. Spray Sensitizer on top of the Wetting Agent.
2. Cover the surface thoroughly.
3. Wait about 30 seconds for it to attach to the surface.

### STEP 9 – RINSE OFF ALL OF THE SENSITIZER



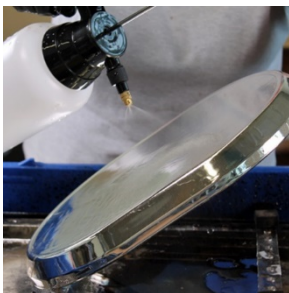
Rinse off ALL of the Sensitizer and Wetting Agent with distilled water.  
You will not be able to rinse off the sensitizing layer.  
Any extra Sensitizer left on the surface can stain the silver brown.

### STEP 10 – SILVER THE GLASS



1. Hold the wand about 1 foot away from the surface.
2. Spray on a single, light, even layer of silver.
3. Wait 10 seconds for the silver to develop and then spray again.
4. Continue spraying and waiting until the silver is fully developed.

### STEP 11 – RINSE THE SILVER



Rinse the silver thoroughly with distilled water.  
You can touch the silvered surface with clean gloves without harming the silver.

### STEP 12 – DRY THE SILVER



1. Set the object aside to dry completely.
2. Do not allow the water to dry in puddles.  
Use a heated fan or hair dryer or allow the silver to air dry in a dust-free location.

When the piece is completely dry, protect the silver with backing paint, lacquer or Clear Uni-Coat depending on your project.

We protected our sample piece with Nikolas Clear Lacquer Spray.

### STEP 13 – PUMP UP OR RELEASE THE SPRAY BOTTLES



If you are going to silver a new piece, pump up your bottles before starting again.

If you are done for the day, unscrew the bottles to release the air pressure and preserve the pumping mechanism.

### STAND BACK AND ADMIRE YOUR HANDIWORK!



That's it!

You have created a perfectly reflective silver surface by hand without electricity or expensive machinery.

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