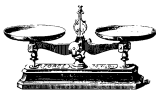
CATALOG NUMBER 04-3010 (To process 20 63x63mm plates)
CATALOG NUMBER 04-3011 (To process 200 63x63mm plates)



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JD-3 HOLOGRAPHY PROCESSING KIT

Holographic film plates, supplies, and instructions for holography are available from:

Integraf LLC
Holography Supplies & Resources
(425) 821-0772
http://www.integraf.com

Recommended by Dr. Tung Jeong of Lake Forest College, the JD-3 holography developer and processing kit provides all the chemicals needed for making holograms using Slavich PFG-01, VRP, VRP-M holographic plates and film sheets. Simply mix the dry chemicals in the JD-3 kit with water to prepare the developer components and bleach solution. If you are using holographic film sheets, remove the film sheet from your film holder after exposure before processing. This formula has been proven to be useful for all kinds of holograms. It is relatively safe, even for the home hobbyist.

JD-3 provides an alternative for using JD-2. The developing chemicals in both kits are the same. Only the bleach is different. The bleach in JD-3 is more benign than that of JD-2, containing copper sulfate and succinic acid instead of potassium dichromate and sodium bisulfate. The trade off for using this more benign bleach is that the JD-3 process adds a post-treatment step using ascorbic acid (Vitamin C) under bright light. Though optional, this step enhances the brightness and longevity of your finished hologram.

FOR YOUR CHEMICAL SAFETY

Like many household cleaners, chemicals in general should be considered dangerous and must be treated with respect. Please read all the warning labels on each package. It is good practice to use eye goggles, dust mask, apron and rubber gloves when mixing chemicals. While the chemicals have low volatility, working in a ventilated area is recommended.

Although most chemicals in JD-3 are considered non-hazardous by the EPA, the kit does contain small amounts of chemicals that the EPA does consider hazardous.

Urea and Ascorbic Acid may irritate the eyes and skin.

Catechol is a toxic central nervous system depressant, methemoglobin former and convulsant; a severe eye, skin, and mucous membrane irritant. It is also a skin sensitizer. Poisoning may affect the liver and kidneys.

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

MIXING THE STOCK SOLUTIONS

The chemicals in this JD-3 kit are already pre-measured to make approximately 1000ml of each of three solutions, and about 500ml of Post-Treatment Stock. You will need to add de-ionized or distilled water, which can be purchased at your local grocery store. It is best to use distilled water that contains no other chemicals although distilled drinking water, which sometimes contains small but negligible amounts of other chemicals, can also be used. Water from your tap generally contains fluoride and other impurities that may reduce the quality of your hologram. For efficiency and safety, teachers or adults should pre-mix the solutions for young students.

Part A

Chemical	Amount	Amount
	(Cat. no. 04-3020)	(Cat. no. 04-3025)
Catechol	20 grams	200 grams
Ascorbic Acid	10 grams	100 grams
Sodium Sulfite	10 grams	100 grams
Urea	75 grams	750 grams
ADD Distilled water	1000 ml	10 liters

Part B

Chemical	Amount	Amount
Sodium Carbonate, Anhyd.	60 grams	600grams
ADD Distilled water	1000ml	10 liters

Bleach Solution

Chemical	Amount	Amount
Copper Sulfate	17 grams	170 grams
Potassium Bromide	55 grams	550 grams
Succinic Acid	2 grams	20 grams
Add Distilled water	1000ml	10 liters

Post-Treatment Stock for JD-3

Chemical	Amount	Amount
Ascorbic Acid	10 grams	100 grams
Add Distilled water	500ml	50 liters

Use four 1 liter (or larger) size clean glass or plastic bottles with leak-proof caps. Label them **Part A, Part B, Bleach,** and **Post-Treatment**, respectively. To help dissolve the chemicals, you can heat the water until it is luke warm. But don't use the solution until it returns to room temperature. Optionally, you can also prepare each solution in a clean beaker and then pour the solution into the bottle.

PART A. Fill the bottle marked Part A with roughly 1000 ml of distilled water. Dissolve each chemical above for Part A one-by-one, in any order. Tightly cap the bottle.

PART B. Follow a similar procedure as above for Part B.

BLEACH. Follow a similar procedure as above for the Bleach.

POST-TREATMENT STOCK. Follow a similar procedure as above for this Post-Treatment, except use only 500ml of water.

All solutions last for many months if capped tightly and stored in room temperature. Refrigeration will further increase shelf-life. Store chemicals it in a safe place away from food and children.

HOLOGRAM EXPOSURE

For detailed instructions on making holograms, study the article "Simple Holography" found on Integraf's website (www.integraf.com). Before making your exposures, you should mix and prepare your chemicals as follows.

PREPARATION

Have the following items on hand:

- Your pre-mixed JD-3 Part A, Part B, Bleach Solution, and Post-Treatment Stock.
- 4 additional liters of distilled or de-ionized water for best results. Tap water will also work but not as well. Avoid hard water. This water will be used to rinse the holograms between each processing step.
- 2 small glass or plastic trays, just large enough so that the hologram you are making can be submerged in a horizontal position.
- 3 large glass or plastic trays to hold 1 liter of distilled water for rinsing. Tap water may also work but not as well.
- 1 (optional, but recommended) large tray to hold 1 liter of distilled water mixed with about 1 ml of photographic wetting agent such as PhotoFlo or Formaflo. You can also use a small tray with less wetting agent, but you should replace the solution after a few holograms.
- 1 rubber glove

Now label one small tray as Developer A&B. Then, mix equal portions of Part A and Part B, enough so that the hologram to be developed can be totally submerged. Once mixed, the combined A&B solution can be used to develop several holograms, and can last several hours.

Next to the developer tray place a large tray with one liter of distilled water. This will be used as the rinse.

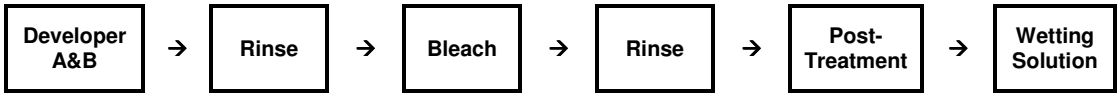
Next, label another small tray as Bleach. Put enough bleach into it so that the hologram can be totally submerged.

Next to the bleach place another large tray with one liter of distilled water. This will be used as a rinse.

Next to the rinse, label a large tray as Post Treatment. Mix roughly 1 part Post-Treatment Stock 10 parts of distilled water (10ml of stock to 1 liter of water) to make the Post-Treatment Bath.

Place a large tray with the wetting solution in 1 liter of distilled water. Using this wetting solution is optional but recommended. It allows the hologram to dry evenly, thus helping you prevent smudges or streaks.

Check the order of the trays: developer A&B, rinse, bleach, rinse, wetting solution.



Alternatively, the Post-Treatment and Wetting Solutions can be placed in a different room if you do not wish to or cannot turn on the lights after the bleaching process. The Post-Treatment must be performed under bright light. This Post-Treatment step is optional but recommended. It enhances the brightness and longevity of your finished hologram.

PROCESSING PROCEDURES

After the holographic plate is exposed, hold it by the edges with your glove hand (or tongs). Keep the emulsion (sticky) side facing upwards to protect the emulsion from accidentally scraping the bottom of your developer tray. Complete the following steps in a dark room. You can use a green safelight. Alternatively you can use a standard night light without allowing any direct light to the holographic plate. (After the bleaching process, it is safe to turn on the lights, if preferred.)

1. Develop:
Quickly submerge the plate into the developer so that all parts get wet evenly. Slush it around for about two minutes. The hologram should turn black.

2. Rinse:
Rinse the developed hologram with agitation for about 20-30 seconds (or up to three minutes for best results).

3. Bleach:
Place the rinsed hologram into the bleaching solution; agitate it until the plate is completely clear (approximately two minutes or less).

4. Rinse again:
Rinse the bleached hologram with agitation for about 20-30 seconds (or up to three minutes for best results)

5. Post -Treatment: (optional)
Under bright light, soak the hologram in the Post-Treatment Bath until the hologram turns from pink to a light brown color. This could take a minute or longer, depending on the brightness of the light (using a desk lamp may take minutes, a slide projector is faster, and direct sunlight is almost instantaneous.)

6. Finish in wetting solution (optional)
Place the finished hologram in the wetting solution for about three minutes. For best results, avoid streaks or runs as you remove the hologram from the solution. You can actually do this step under light so you observe if the wetting solution is evenly coated. (After the bleaching process, the hologram is safe to process under regular indoor lighting).

A good way to dry the hologram is to stand it against a vertical surface with the bottom edge resting on a hand-towel or tissue paper. Best results are obtained when it dries naturally in clean, dust-free air. However, if time is limited, the hologram can be quick-dried by holding it vertically and blowing warm air across it with a hair dryer. For holographic film sheets, hang up vertically to dry, using clean and dry clothespins.

For a reflection hologram, the image can be viewed after thorough drying, which may take minutes to hours, depending on ambient conditions and technique. Transmission holograms, on the other hand, can be viewed with a laser even when wet.