

Volume of Stock Solution B to be added,

$$\frac{1000}{16} \times 3 \text{ (from Beers' Chart, \#4)} = 187.5 \text{ ml}$$

Volume of water to be added,

$$\frac{1000}{16} \times 8 \text{ (from Beers' Chart, \#4)} = 500 \text{ ml}$$

The total volume will be:

$$312.5 + 187.5 + 500 = 1000 \text{ ml}$$

## DEVELOPMENT

A typical development run using Dr. Beers' Developer would be as follows:

- Develop: 3 to 3.5 minutes  
Stop: 30 seconds in acetic stop bath (cat. no. 03-0185)  
Fix: 5 minutes in first bath of a two-bath fixer and 5 minutes in the second bath. Use Formulary Fixer 24 (cat. no. 03-0010).  
Wash: 1 minute in running water  
Clear: 2-3 minutes using Formulary Hypo Clear Agent (catalog number 03-0165)  
Wash: 10-20 minutes in running water

Ansel Adams gives an excellent and detailed description of the use of Dr. Beers' developer in his book "The Print", pp. 60-65. In this method, the paper is exposed for the highlights and developed for the shadows.

Three trays of Dr. Beers' working solution are prepared. The first tray contains Beers' #1; the second, Beers' #4; and the third, Beers' #7.

Expose a test strip and develop it in Beers' #4. After the test strip has been fixed, decide which exposure produced good clean highlights with some detail. Using this exposure setting, expose a print and develop it in Beers' #4. After fixing, view the print and decide if the shadows are too light, too dark, or just right.

If the shadows are too light, develop the next print in Beers' #7. The shadows will be darker and the print will have more contrast. A slight decrease in exposure may be necessary to keep the highlights clean.

If the shadows are too dark, develop the next print in Beers' #1. A slight increase in exposure may be necessary to keep the detail in the highlights.

To further fine-tune the print, use Beers' #2 and #3 or Beers' #5 and #6, depending upon the results from the above test.

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# FORMULARY DR. BEERS' VARIABLE CONTRAST PAPER DEVELOPER

P.O. Box 950 • Condon MT 59826 • 800-922-5255 • FAX 406-754-2896  
E-mail: formulary@photoformulary.com

## FORMULARY DR. BEERS' VARIABLE CONTRAST PAPER DEVELOPER

Directions for mixing and using Formulary Dr. Beers' Paper Developer, 1-liter size (cat. no. 02-0120) and 2-liter size (cat. no. 02-0130).

Dr. Roland F. Beers formulated his developer so that he could change print contrast using a single type of paper. Today, Dr. Beers' developer is extremely useful to fine-tune the contrast of a print.

The range of contrast that can be obtained using the Dr. Beers' developer is not large. In terms of paper contrast grades, the variation is only about 1.5 paper grades. For example, a number two paper can be printed from about grade 1.25 to about grade 2.75. However, any amount of contrast gradation within this range can be achieved by combining different proportions of the two stock solutions to obtain the working solution.

Stock Solution A contains metol, a soft-working developer. When stock Solution A is used alone a low-contrast print is obtained. Stock Solution B contains hydroquinone, a high contrast developer. When Stock Solution B is used alone, a high contrast print is obtained. Intermediate degrees of contrast are obtained by using various mixtures of Solutions A and B.

## CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the chemical warnings listed below, and on each package. Always use rubber gloves and a dust mask when using chemicals.

**HYDROQUINONE:** Considered hazardous by EPA. It is considered a skin sensitizer, and may cause eye or skin irritation. Please handle this liquid with

gloves and splash goggles. If ingested or splashed in the eyes, contact a physician.

**METOL:** Some individuals become sensitized (develop allergic symptoms or rashes) when using metol. If this should occur, discontinue use and consult a physician.

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 WITHIN 30 DAYS FOR A FULL REFUND.**

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

### MIXING THE STOCK SOLUTION

You will need two dark brown bottles, each with a capacity of one liter (or 2 liters).

#### Stock Solution A

##### Kit Size

Chemical	1 liter	2 liters
Water (52° C/125° F)	750 ml	1500 ml
Metol	8 g	16 g
Sodium Sulfite, Anhydrous	23 g	46 g
Sodium Carbonate, monohydrate	23.4 g	46.8 g
Potassium Bromide	1.1 g	2.2 g
Cold distilled water to make	1000 ml	2000 ml

### FOR BEST RESULTS USE DISTILLED WATER.

Place the warm water in the storage container and add a pinch of sodium sulfite. (This minimizes the initial oxidation of the metol. If more sulfite is added at this point, the metol will not dissolve.) Add the metol to the solution and stir (or cap and shake the container) until all of the metol is dissolved. It is important that all of the metol be dissolved before the other chemicals are added. Add the sodium sulfite, stir (or cap and shake the container) until the solid dissolves. Add each chemical in the order given in the table above. Be sure each chemical is completely dissolved before adding the next one to the solution. Finally, add cold water to the solution to bring its final volume up to 1000 ml (or 2000 ml)

#### Stock Solution A

##### Kit Size

Chemical	1 liter	2 liters
Water (52° C/125° F)	750 ml	1500 ml
Sodium Sulfite, Anhydrous	23 g	46 g

Sodium Carbonate, monohydrate	31.5 g	63 g
Hydroquinone	8 g	16 g
Potassium Bromide	2.2 g	4.4 g
Cold distilled water to make	1000 ml	2000 ml

Dissolve each chemical in the order given. Be sure each chemical is completely dissolved before the next is added to the solution. Finally, add cold water to the solution to bring its final volume up to 1000 ml (or 2000 ml)

### LIFE OF THE SOLUTIONS

Both stock solutions have a shelf life of 4-6 months in full and stoppered bottles. The working solution has a tray life of 1 day.

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### USING THE DEVELOPER

#### Mixing the working solution:

The working solution is prepared just prior to use and usually discarded after a working session. The amounts of stock solution A, stock solution B, and water that are combined are determined from the following chart.

----- increasing contrast -----

Solution	#1	#2	#3	#4	#5	#6	#7
Parts of Stock Sol. A	8	7	6	5	4	3	2
Parts of Stock Sol. B	0	1	2	3	4	5	14
Parts of water	8	8	8	8	8	8	0

----- increasing softness -----

\*There is no relationship between a Beers' number and the contrast grade of a paper. You must select the contrast grade of paper that matches your negative and then use Dr. Beers' developer to fine-tune the print. The Dr. Beers' developer will only change the contrast 3/4 of a grade in either direction, either harder or softer from the original paper grade.

The Beers' chart is given in terms of "parts". A "part" is a method of expressing volumes. The following two examples show how the "parts" given in the Beers' chart can be used to mix specific volumes.

**Example 1: Mix Volumes Equal to the Number of Parts**

Beers' Solution #2, for example, contains 7 parts of Stock Solution A, 1 part Stock Solution B, and 8 parts of water. Therefore, use 7 ml of A, 1 ml of B, and 8 ml of water, or use 70 ml of A, 10 ml of B, and 80 ml of water, etc.

**Example 2: Use the Beers' Chart to Mix a Specific Volume of Working Solution**

For example, prepare 1000 ml of Beers' #4.

Use the following formula:

$$\frac{\text{Final volume of solution desired}}{16} \times \text{parts for that stock solution}$$

Volume of Stock Solution A to be added,

$$\frac{1000}{16} \times 5 \text{ (from Beers' Chart, #4)} = 312.5 \text{ ml}$$