

Using KODAK FLEXICOLOR Chemicals in a Small Tank



You can use KODAK FLEXICOLOR Chemicals in a small tank for manual processing of these Kodak color negative films:

KODAK Bright Sun Film
KODAK Bright Sun & Flash Film
KODAK High Definition Film
KODAK MAX Versatility Film
KODAK MAX Versatility Plus Film
KODAK PROFESSIONAL ULTRA COLOR Film
KODAK PROFESSIONAL PORTRA Film

For best results, carefully mix the chemicals according to the instructions, and follow the processing guidelines in this publication.

EQUIPMENT

You'll need the following equipment for small-tank processing:

- 1-pint (500 mL) small invertible processing tank, preferably stainless steel
- three beakers or containers with a capacity of at least 500 mL, preferably glass or stainless steel
- thermometer that is accurate to $\pm 0.06^{\circ}\text{C}$ ($\pm 0.1^{\circ}\text{F}$)
- 11 x 14-inch processing tray (or similar container)
- darkroom timer

We also suggest using a temperature-controlling valve on the water supply or a recirculating water-temperature controller.

CHEMICALS

You'll need the following chemicals, which are supplied as liquid concentrates for easy mixing:

KODAK FLEXICOLOR Developer—To make
1 U.S. gallon, CAT No. 192 7698

KODAK FLEXICOLOR Bleach III—To make
1 U.S. gallon, CAT No. 894 0801

KODAK FLEXICOLOR Fixer and Replenisher—
To make 1 U.S. gallon, CAT No. 156 5175

KODAK FLEXICOLOR Final Rinse and Replenisher—To make 5 litres, CAT No. 867 3170

Be sure to observe all precautionary information on the chemical labels and packaging before mixing and using the chemicals.

TEMPERATURE CONTROL

For best results in processing color negative film, temperature control is very important. The temperature of the developer is critical and must be maintained at $37.8 \pm 0.15^{\circ}\text{C}$ ($100 \pm 0.25^{\circ}\text{F}$). The temperature of the other solutions is not as important, as these solutions will perform well between a temperature range of 24 to 42°C (75 to 105°F). Use a thermometer that is capable of reading these temperatures accurately.

You can control the temperature of the developer and other solutions by using a tempered water bath. Use a processing tray of adequate size to hold the containers of processing solutions and the small invertible processing tank. The tray should be deep enough to keep the level of the tempered water just below the level of the solution in the invertible processing tank and solution containers.

Maintain the temperature of the water bath by running tempered water through the tray, or by using a temperature controller to circulate the water. The temperature of the water bath should be $38 \pm 0.15^{\circ}\text{C}$ ($100.5 \pm 0.25^{\circ}\text{F}$). The slightly higher temperature of the bath should compensate for the slight cooling that will occur in the processing tank during the agitation cycles of processing.

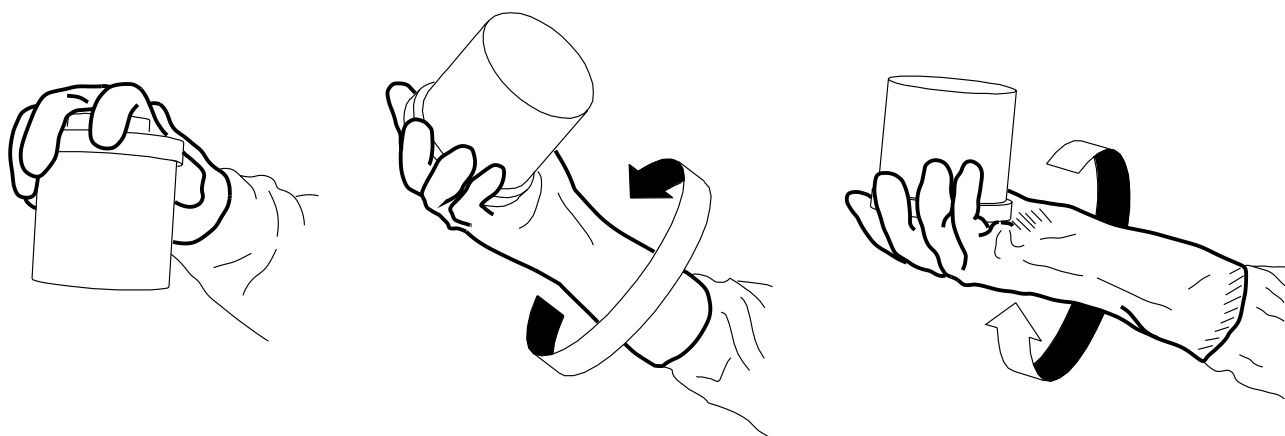
PROCESSING

After mixing the processing chemicals according to directions, take the cover off the small invertible processing tank and add enough developer so that the tank will be completely full with the processing reel(s) added. Place the processing tank in the tempered water bath and allow enough time for the developer to reach the temperature of the water bath. Pour the other solutions into appropriate-sized beakers or containers. If the temperature in the darkroom is not adequate to keep the bleach, fix, and rinse solutions at the appropriate temperature, you may find it convenient to add these containers to the tempered water bath.

In complete darkness, load the film onto the processing reel(s), then place the loaded reel(s) into the small invertible processing tank. Quickly start the darkroom timer and place the cover on the processing tank, and begin initial agitation.

Note: If the small invertible processing tank is lighttight, you can turn the lights on at this point. Otherwise, leave the lights off until after the bleach step is completed then turn the lights on.

Follow the processing and agitation procedures in the table below. Agitate the tank by turning the tank over (inverting it) with a slight rotation (quarter turn), then return the tank to an upright position. Do this at a rate of one agitation cycle per second.



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Processing Steps and Conditions

Solution/Step	Time (min:sec)	Temperature °C (°F)	Comments
Developer	3:15	37.8 ± 0.15 (100 ± 0.25)	Initial agitation for 30 seconds, followed by 2 seconds of agitation every 15 seconds. Use last 10 seconds of this step to drain tank.
Bleach	6:30	24 to 41 (75 to 105)	Initial agitation for 30 seconds, followed by 5 seconds of agitation every 30 seconds. Use last 10 seconds of this step to drain tank.
Wash	1:30	24 to 41 (75 to 105)	Use running-water wash at rate that will fill tank every 4 seconds. Or fill tank with water, agitate for 5 seconds, and dump. Repeat cycle throughout wash time. Use last 10 seconds of this step to drain tank.
Fixer	6:30	24 to 41 (75 to 105)	Initial agitation for 30 seconds, followed by 5 seconds of agitation every 30 seconds. Use last 10 seconds of this step to drain tank.
Wash	3:15	24 to 41 (75 to 105)	Repeat procedure used for first wash.
Final Rinse	1:30	24 to 41 (75 to 105)	Initial agitation for 30 seconds; no further agitation required.
Dry	As needed	24 to 43 (75 to 110)	Remove film from reel, and hang film to dry in dust-free place or drying cabinet. Attach film clip to top to hang it, and add weighted clip to bottom to prevent curl.

Push-Processing KODAK PROFESSIONAL ULTRA COLOR and PORTRA Films

KODAK PROFESSIONAL ULTRA COLOR 400UC and PORTRA 800 Films are designed so that you can push-process them to higher exposure indexes. You can push-process ULTRA COLOR 400UC Film to an exposure index of 800, and PORTRA 800 Film to exposure indexes of 1600 and 3200, and produce negatives that yield good-quality prints.

To push-process these films, extend the developer time according to the table below. Keep all other process times the same as those for a normal process.

Exposure Index	Development Time (min:sec)
ULTRA COLOR 400UC Film	
EI 400	3:15
EI 800 (Push 1)	3:45
PORTRA 800 Film	
EI 800	3:15
EI 1600 (Push 1)	3:45
EI 3200 (Push 2)	4:15

CAPACITY OF SOLUTIONS

Do not reuse the developer. Use the developer for one process cycle, and then discard it. You can use the bleach, fixer, and final rinse once, or save and reuse them until the solution capacities are reached. Use the table below to calculate the capacity of the bleach, fixer, and final rinse only.

Film Size	Bleach, Fixer, or Final Rinse Capacity per Quart/Litre
110-24	25 cartridges
135-12	20 rolls
135-24	12 rolls
135-36	10 rolls
120	10 rolls

STORAGE OF SOLUTIONS

Store unmixed chemical concentrates in a dry location at a temperature of 5 to 30°C (0 to 86°F). Lower temperatures may cause components to come out of solution or crystallize. Higher temperatures can accelerate chemical reactions and cause deterioration of chemical components.

Store mixed solutions in tightly sealed bottles—preferably full, tightly stoppered glass bottles. For best results, do not use mixed solutions that have been stored longer than the following times:

Mixed Solution	Storage Time in Full, Tightly Stoppered Bottles
Developer	6 weeks
Bleach, Fixer, Final Rinse	8 weeks

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SAFE HANDLING OF KODAK PROCESSING CHEMICALS

Chemicals are safe when handled properly. That's why it's important to know and understand the chemicals you're working with and the appropriate protective measures you should use when handling them. To safely handle photographic processing chemicals, follow these guidelines:

- Always read and observe recommendations on the product labels and the Material Safety Data Sheets (MSDS) before mixing and using the chemicals. MSDS sheets can be obtained on-line at **www.kodak.com/go/msds**.
- When handling chemicals, avoid any skin and eye contact. Wear protective clothing to ensure your safety such as:
 - Neoprene or nitrile gloves, to prevent contact with skin
 - Safety glasses with side shields or goggles, to prevent chemicals from getting into your eyes
 - Vinyl or rubber apron or lab coat, to prevent chemicals from coming in contact with your clothing
- Do not eat, drink, or smoke in chemical handling areas.
- To avoid build-up of air contaminants associated with processing chemicals, provide adequate ventilation in chemical handling areas. Using a room with a source of fresh air is recommended. As a guideline, the ventilation required should change the entire volume of air in the area 5 times per hour. In some cases, locally venting the chemical work area to the outdoors may be appropriate to prevent excess humidity and odors in the chemical handling areas.
- Properly dispose of photographic processing chemicals in accordance with local sewer discharge regulations. Kodak does not recommend the use of septic systems for disposal of photographic processing chemicals.
- For information on darkroom design, see the following publication on **www.kodak.com/go/professional**
 - AK-3, *Darkroom Design for Amateur Photographers*
- For more information, see the following KODAK Publications on **www.kodak.com/go/kes**
 - J-98A, *Safe Handling of Photographic Processing Chemicals*
 - J-300, *Environmental Guidelines for Amateur Photographers*
 - J-314, *Indoor Air Quality and Ventilation in Photographic Processing Facilities*

MORE INFORMATION

Kodak has many publications to assist you with information on Kodak products, equipment, and materials.

For the latest version of technical support publications for KODAK Products, visit Kodak on-line at:
www.kodak.com

If you have questions about KODAK Products, call Kodak.
In the U.S.A.:

1-800-242-2424, Monday–Friday
9 a.m.–7 p.m. (Eastern time)

In Canada:

1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

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