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**KODAK PHOTO-FLO 200 Solution**  
**KODAK PHOTO-FLO 600 Solution**  
**KODAK PHOTO-FLO 2100 Solution**

## 1) Description

- Concentrated wetting agent used as a final step in processing to inhibit the formation of water spots or streaks on films and plates.
- Generally used on silver-based black-and-white films and plates. Not intended for use as a replacement for stabilizers or final rinses in color film processes.
- Also used as a surfactant to aid in the smooth application of water-based retouching materials to processed films, plates and papers, both black-and-white and color.
- Available in 3 different concentrations to accommodate all users, from darkroom hobbyists to large scale professional labs. When mixed according to directions, all 3 concentrations result in equivalent working solutions.
- Recommended for use in water only. Not intended to be added to processing solutions.

**Warning:** Observe precautionary information on containers and in Material Safety Data Sheets!

Slightly different components are used to achieve the 3 different concentrations of KODAK PHOTO-FLO Solution (200, 600, and 2100). Precautionary information on containers and in MSDS's differ for each PHOTO-FLO product.

PHOTO-FLO Solutions are eye irritants. Wear adequate eye protection when mixing and using this product. Avoid contact with clothing or prolonged contact with skin.

PHOTO-FLO 600 Solution is harmful or fatal if swallowed.

PHOTO-FLO 2100 Solution causes eye burns.

For Emergency Health, Safety, and Environmental Information

on all Kodak products, call:

**(716) 722-5151**

24 hours a day

## 2) Material Safety Data Sheet Information

Obtain the Material Safety Data Sheet for this product and other Kodak chemicals by calling (800) 242-2424, sending a facsimile to (716) 724-9656, or writing to:

Eastman Kodak Company

Dept 841, R1 Riverwood

343 State Street

Rochester, NY 14650-0811

Please provide the Catalog Number for these products when requesting the MSDS.

PHOTO-FLO 200 Solution: CAT 146-4502 or CAT 1454510

PHOTO-FLO 600 Solution: CAT 146-4528

PHOTO-FLO 2100 Solution: CAT 141-8904

## 3) Mixing Instructions

**Warning:** Observe precautionary information on containers.

**Components:**

PHOTO-FLO 200 Solution:	Single solution, liquid concentrate
PHOTO-FLO 600 Solution:	Single solution, liquid concentrate
PHOTO-FLO 2100 Solution:	Single solution, liquid concentrate

**Mixing Fresh Working Solutions for General Use:**

Working solutions of PHOTO-FLO 200, PHOTO-FLO 600, and PHOTO-FLO 2100 Solutions are mixed by proportion from the concentrates. The following table gives nominal recommendations for mixing.

Water temperature for mixing is not critical, but warm or hot water (if needed to temper excessively cold water) should be used with caution. (See below).

Product:	Start With Water:	Add PHOTO-FLO Concentrate:	Mix:
PHOTO-FLO 200	200 parts	1 part	Mix until solution is uniform.
PHOTO-FLO 600	600 parts	1 part	Mix until solution is uniform.
PHOTO-FLO 2100	2100 parts	1 part	Mix until solution is uniform.

Concentration of working solutions may need to be varied to suit specific requirements for use, or local water quality. If tap water is very hard or contains high levels of dissolved solids, mixing PHOTO-FLO Solutions with filtered, de-ionized, or even distilled water is suggested.

PHOTO-FLO Solutions mixed with warm or hot water may develop a layer of foam as microscopic air bubbles are released from the water as it cools. Either let warm water stand to clear the suspended air before mixing, or strip the foam from the surface of the mixed solution with a clean squeegee or similar tool after mixing.

Avoid shaking or aggressively mixing either the concentrate or working solution, because the bubbles formed are not readily dissipated.

#### 4) Using Working Solutions

**Warning:** Observe precautionary information on containers.

When Used As a Final Step in Processing, KODAK PHOTO-FLO Solution promotes uniform draining and spot-free drying of films and plates. KODAK PHOTO-FLO Solution is generally recommended for conventional silver-based black-and-white films and plates. See film or plate information for specific recommendations.

**Manual and Rotary Tube Processing:**

After thorough washing, bathe the film or plate for 30 seconds in working strength PHOTO-FLO Solution. Drain briefly and then position the film or plate to dry.

**Rotary tube:** Use PHOTO-FLO Solution in a separate tank following the final wash. Do not run PHOTO-FLO Solution in a rotating drum, since the agitation will form large volumes of persistent bubbles.

The PHOTO-FLO Solution should form a uniform sheet of liquid on the surfaces of the film or plate, free of beads, streaks or air bubbles.

Passive drying or forced-air drying may be employed, with or without heat. The dry film or plate should be clean and free of scum or spots.

**Manual and Rotary Tube Processing Troubleshooting:**  
**Beading and streaking on the wet film or plate:**

If the liquid surface on the film or plate breaks into beads or streaks during or shortly after draining, marks will likely be left on the dry film or plate. Re-immerses the film or plate in the PHOTO-FLO Solution for another 30 seconds. If beading persists and the solution is fresh, increase its concentration slightly by adding PHOTO-FLO Solution concentrate. If the solution is old, or has been used, replacement with fresh working solution is recommended.

High drying temperatures, especially coupled with low relative humidity, can lead to spotting or streaking as emulsions dry too quickly or unevenly. Emulsion side drying spots are usually permanent defects.

**Bubbles in the solution:**

If too many bubbles have formed in the solution and are subsequently transferred to the film surface, they may be removed by dipping the film quickly in and out of fresh water. After the water immersion, immediately hang the film up to dry in the usual manner. Bubbles floating on the surface of the PHOTO-FLO working solution may be swept to the side of the tank and pulled away from the solution with a clean squeegee or similar tool. If these techniques do not work, use a fresh solution of PHOTO-FLO.

**Scum on the dry film or plate:**

If the concentration of the working strength KODAK PHOTO-FLO Solution is too high, it can cause a scum to form on the film or plate surfaces. If this occurs, rewash the film and retreat it in PHOTO-FLO Solution of reduced concentration.

Scumming can also result from old solutions, biological growth, or solutions that have accumulated gelatin, etc. from over-use.

Scum on the base side usually can be removed by wiping carefully with a clean soft cloth, chamois, or cotton ball. Scum on the emulsion side can be harder to detect, and usually requires re-washing to remove.

**Continuous and Rack-and-Tank Processing:**

KODAK PHOTO-FLO Solution can be used as a final rinse in continuous and rack-and-tank processors to minimize water spots and streaking. The processor may have to be modified to isolate the last wash tank from incoming wash water, to maintain concentration of the PHOTO-FLO Solution.

**Continuous and Rack-and-Tank Processing Troubleshooting:**  
**Drying marks:**

Drying spots sometimes occur on the emulsion side of the film and generally emanate from the perforations on 135-size films (shoreline marks, or "mouse-ears"). These, and other spots, are most likely to occur under fast drying conditions, i.e., low humidity and high temperature.

Film that exits the processor drying cabinet with a significant curl toward the emulsion side, especially a curl that relaxes as the film cools, is often indicative of a dryer temperature that is too high.

Emulsion side drying spots are usually permanent defects, whereas scum on the base side can often be removed by wiping carefully with a clean soft cloth, chamois, or cotton ball.

Emulsion side drying spots can sometimes be avoided by slightly increasing the concentration of KODAK PHOTO-FLO Solution in the final rinse.

**Continuous and Rack-and-Tank Processing Maintenance:**

Since the final rinse is not replenished and is further diluted by wash water which may contain bits of gelatin, slime or algae may build up on the tank surfaces.

Under average conditions, the tank should be cleaned and refilled at least once a week. Conditions of high film volume or poor water quality may require replacement of the solution daily. Allowing the tanks to stand empty overnight will help eliminate the formation of algae. For persistent bio-growth problems, the tanks should be cleaned periodically by treatment with a 5-percent solution of CLOROX or similar chlorine laundry bleach, followed by a thorough rinsing with clean water.

**5) Storing Solutions**

Concentrates of PHOTO-FLO Solution should last indefinitely if the container is tightly capped.

Because of the convenience and high concentration of the liquid concentrates, mixing of working solution just before use is recommended. Also because of the high concentration of PHOTO-FLO Solution, "one-shot" use delivers the highest quality final rinse while remaining economical.

**Capacity**

The surfactant capacity of a working tank of PHOTO-FLO Solution will depend in part on the amount of film put through it, the quality of the water used in mixing, and the length of time a working solution is kept in service. Generally, it is recommended that the solution be changed when it begins to bead, streak, or leave scum on the surface of films or plates, or once per week, whichever is sooner.

Formation of slime on tank walls, and / or evidence of biological growth in the tank are also indications that the solution should be changed more frequently.

**6) Disposal of Exhausted Solutions**

Discharge, treatment, or disposal of spent solutions may be subject to local, state, or federal laws. Contact appropriate authorities to determine the requirements that apply to the use of this product.

If you have questions or need assistance, contact your local Kodak representative.

The contents of this publication are subject to change without notice.

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**End of Data Sheet**

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