



TI2471

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Using KODAK PROFESSIONAL First Developer Replenisher, Process E-6 and Process E-6AR

General Information

KODAK PROFESSIONAL First Developer Replenisher has an improved formula that is designed for optimum performance with the latest technology reversal films in professional processing labs. The solution is more stable, reduces the formation of precipitates in solution, and lowers chemical and biological oxygen demand in the processor effluent.

Due to significant differences in formulation, working replenisher and fresh tank solutions prepared from KODAK PROFESSIONAL First Developer Replenisher have lower specific gravities than corresponding solutions prepared from KODAK First Developer Replenisher. KODAK PROFESSIONAL First Developer Replenisher has a lower chemical load than KODAK First Developer Replenisher, resulting in less BOD and COD in the processor effluent.

Physical Characteristics

The concentrate is normally a clear, slightly yellow to distinctly yellow solution with little or no odor.

Sizes and Availability

In the US, KODAK PROFESSIONAL First Developer Replenisher is supplied in the following sizes:

Process E-6 (to make 10 litres)	CAT No. 831 3611
Process E-6 (to make 5 gallons)	CAT No. 100 7608
Process E-6AR (to make 25 gallons)	CAT No. 800 8401

Note: Fresh tank solutions prepared from KODAK PROFESSIONAL First Developer Replenisher must use KODAK PROFESSIONAL First Developer Starter, US CAT No. 167 1577.

In EAMER and APR, KODAK PROFESSIONAL First Developer Replenisher is supplied in the following sizes:

Process E-6 (2 x 20 L)	CAT No. 526 2589
Process E-6 (300 L)	CAT No. 526 2597
Process E-6 (2 x 5 L)	CAT No. 526 2605
Process E-6AR (20 L AR)	CAT No. 526 2613

Note: Fresh tank solutions prepared from KODAK PROFESSIONAL First Developer Replenisher must use KODAK PROFESSIONAL First Developer Starter, EAMER and APR CAT No. 526 2670.

Processors

KODAK PROFESSIONAL First Developer Replenisher is used for Process E-6 in all processing machines, and can be used in batch processing in sink lines and small tanks when manual replenishment is used.

Note: For rotary-tube processors, the KODAK PROFESSIONAL Single-Use Chemistry Kit, Process E-6, is a more appropriate choice. See TI2443, "KODAK PROFESSIONAL Single-Use Chemistry Kit, Process E-6."

Films

All KODAK EKTACHROME Films for which Process E-6 is recommended can be processed in equipment that will accommodate the film size.

Mixing

Notice: Observe precautionary information on product labels and on the Material Safety Data Sheets.

Mix solutions according to the instructions packaged with the chemicals.

Mixing instructions are provided here to prepare replenisher from KODAK PROFESSIONAL First Developer Replenisher, Process E-6 or Process E-6 AR, and a fresh working tank solution from KODAK PROFESSIONAL First Developer Replenisher, Process E-6 and KODAK PROFESSIONAL First Developer Starter. Other solution preparations do not change.

Replenisher

When using:	Use these mixing instructions:
KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (to make 10 litres, CAT No. 831 3611) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (to make 5 gallons, CAT No. 100 7608) KODAK PROFESSIONAL First Developer Replenisher, Process E-6AR (to make 25 gallons, CAT No. 800 8401) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (300 L, CAT No. 526 2597) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (2 x 5 L, CAT No. 526 2605) KODAK PROFESSIONAL First Developer Replenisher, Process E-6AR (20 L AR, CAT No. 526 2613)	For each litre of solution, mix 200 mL of KODAK PROFESSIONAL First Developer Replenisher, Process E-6 or Process E-6AR, with 800 mL of water.
KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (2 x 20 L, CAT No. 526 2589)	For each litre of solution, mix 250 mL of KODAK PROFESSIONAL First Developer Replenisher, Process E-6, with 750 mL of water.

For best results, do not use pre-mixed replenisher that has been stored for longer than 8 weeks.

Fresh Tank

From Mixed Replenisher:

For each litre of solution, mix 950 mL of replenisher with 50 mL of water. Add 5 mL of KODAK PROFESSIONAL First Developer Starter, and mix.

From Concentrate:

When using:	Use these mixing instructions:
KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (to make 10 litres, CAT No. 831 3611) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (to make 5 gallons, CAT No. 100 7608) KODAK PROFESSIONAL First Developer Replenisher, Process E-6AR (to make 25 gallons, CAT No. 800 8401) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (300 L, CAT No. 526 2597) KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (2 x 5 L, CAT No. 526 2605) KODAK PROFESSIONAL First Developer Replenisher, Process E-6AR (20 L AR, CAT No. 526 2613)	For each litre of solution, start with 810 mL of water. With stirring, add 190 mL of concentrate. Finally, add 5 mL of KODAK PROFESSIONAL First Developer Starter, and mix.
KODAK PROFESSIONAL First Developer Replenisher, Process E-6 (2 x 20 L, CAT No. 526 2589)	For each litre of solution, start with 762.5 mL of water. With stirring, add 237.5 mL of concentrate. Finally, add 5 mL of KODAK PROFESSIONAL First Developer Starter, and mix.

Specific Gravity

Solution	Aim +/- Tolerance
Fresh Tank Solution	1.055 +/- 0.003 at 27°C (80°F) 1.052 +/- 0.003 at 38°C (100°F)
Replenisher	1.057 +/- 0.003 at 27°C (80°F) 1.054 +/- 0.003 at 38°C (100°F)
Seasoned Tank Solution	1.060 +/- 0.003 at 27°C (80°F) 1.057 +/- 0.003 at 38°C (100°F)

Note: Other Process E-6 solution specific gravity values are found in KODAK Publication Z-119, "Using KODAK Chemicals, Process E-6," or in KODAK Publication Z-6, "KODAK Q-LAB Process Control Handbook."

Storage

Store unused working-strength solutions at 40 to 85°F (4.5 to 29.5°C) in full stoppered bottles or in tanks with floating lids to minimize oxidation. Store unused concentrates in full containers. Do not use solutions that have been stored longer than the following times:

Mixed Solution	Tanks with Floating Covers	Partially Filled Bottles
First developer replenisher or fresh tank solution	8 weeks	1 week

Processing

	Solution Wet Time (minutes)			Temperature °F (°C)	Agitation (A), Recirculation (R), Filtration (F), Squeegee (S)		
	Lower Limit	Recommended Time	Upper Limit		Rack & Tank	Roller Transport	Continuous
Total darkness required							
First Developer LORR	5	6	7	98 to 103 (36.7 to 39.5)	N2 ^[1] , R, F	R, F	N2, R, F, S
First Wash	1	2	4	92 to 103 (33 to 39.5)	Air ^[1]	None	None, S
Reversal Bath	1	2	4	75 to 103 (24 to 39.5)	None	None	None, S
Remaining steps can be done in room light							
Color Developer	5	6	7	98 to 103 (36.5 to 39.5)	N2 ^{[1][2]} , R, F	R, F	N2, R, F, S
Pre-Bleach	2	2	4	75 to 103 (24 to 39.5)	None	None	None, S
Bleach	6	6	8	92 to 103 (33 to 39.5)	Air ^[1] , R, F	Air, R, F	Air, R, F, S
Fixer	4	4	6	92 to 103 (33 to 39.5)	Air ^[1] , R, F	R, F	Air, R, F, S
Wash ^[3]	2	2	4	92 to 103 (33 to 39.5)	Air ^[1]	None	None
Wash ^[3]	2	2	4	92 to 103 (33 to 39.5)	Air ^[1]	None	None, S
Final Rinse	1/2	1	4	Ambient	None	None	None, S
Dry			As needed	Up to 145 (63)			

^[1]One 2-second burst with an 8-second interval.

^[2]Immediate initial agitation in the color developer is important for best film uniformity.

^[3]Parallel flow, two separately fed tanks, equal volume. Counter current flow will require less water.

Developer Time and Temperature

When starting a fresh process, set process time and temperature to aim. Using KODAK Process Control Strips, Process E-6, adjust time and/or temperature, keeping within published process specifications, to obtain acceptable sensitometric results.

Replenishment

There are no replenishment rate changes when using KODAK PROFESSIONAL First Developer Replenisher. Solution replenishment rates based on mL/m² or mL/ft² of film processed, are given below for nominal process cycle. Calculate replenishment rates per rack according to the distribution of film sizes processed.

Replenishment Rates

	per m ²	per ft ²
First Developer	2153 mL	200 mL
Reversal Bath	1076 mL	100 mL
Color Developer	2153 mL	200 mL
Color Developer LORR	1076 mL	100 mL
Pre-Bleach	1076 mL	100 mL
Bleach	215 mL	20 mL
Fixer	1076 mL	100 mL
Final Rinse	1076 mL	100 mL

Low Utilization

Low utilization is a condition in which a processor takes longer than three weeks to complete a first developer tank turnover. The procedure below first establishes a *minimum daily square footage requirement* for “normal” replenishment rates. Following are recommendations for processors that do not meet this minimum square footage requirement. You can follow this procedure for any processor type that uses replenishment.

1. To determine the minimum daily square footage requirement, multiply the first developer tank volume (in litres) by 5; then divide by the number of days the processor is operated during a three-week period.

For example, a processor with a first developer tank volume of 70 litres operated for 15 days over a three-week period would have a minimum daily square footage requirement of 23 square feet ($(70 \times 5) \div 15 = 23$).

2. Throughout the day, record the amount of film processed.

3. At the end of each day, compare the amount of film processed (in square feet) to the minimum daily square footage requirement.

If:

The amount of film processed meets or exceeds the minimum daily square footage requirement.

Then:

No additional replenishment is required.

The amount of film processed is less than the minimum daily square footage requirement.

You need to adjust for low utilization. Replenish all of your tank solutions for the difference in square footage. You will also need to add 1 mL of first developer starter to your first developer tank solution for every square foot of film processed below the minimum daily requirement. **Do not** add color developer starter to the color developer tank; additional starter will lower color developer activity. The first time you use this procedure, you may have to reoptimize your process by adjusting the activity of the color developer replenisher as described in Section 4 of KODAK Publication Z-119, *Using KODAK Chemicals, Process E-6*.

Example:

Your minimum daily square footage requirement is 23 square feet, but you only processed 18 square feet of film. The difference between the minimum requirement and the amount of film processed is 5 square feet. You need to replenish all your solutions for the 5 square feet of film you did not process. You also need to add 5 mL of first developer starter to the first developer tank solution. (For processors that have a 1 square foot replenishment cycle, you need 5 additional replenishment cycles.)

Note: If your processor has very low utilization, you may want to divide your minimum daily square footage requirement in half, and compare the amount of film processed with the minimum requirement twice during the day (i.e. at midday and at shutdown), and make any adjustments necessary.

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

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End of Instruction Sheet
