



Using New KODAK EKTACOLOR Rapide Chemicals in the System 89 DLS Digital Minilab

The processing chemicals that you use in a particular minilab system depend on the type of processor the system incorporates and its process cycle. This publication describes the use of the new KODAK EKTACOLOR Rapide Chemicals to process KODAK EDGE Plus and ROYAL Plus Papers in the System 89 DLS Digital Minilab.

These chemicals are designed for a **new** rapid process cycle called Process RA-RC. The rapid process cycle permits increased print production with the System 89 DLS Digital Minilab.

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RECOMMENDED KODAK CHEMICALS

For the System 89 DLS Digital Minilab, use KODAK EKTACOLOR Rapide Chemicals. They are supplied in sizes specially designed for your equipment. They offer convenience, cost savings, and a minimum of solution waste.

EKTACOLOR Rapide Developer Replenisher offers the advantages of a single-part concentrate for convenient handling and a low replenishment rate. In addition to the developer, you will need EKTACOLOR Rapide Bleach-Fix and Replenisher and EKTACOLOR Rapide Stabilizer and Replenisher.

Note: If you are currently using EKTACOLOR PRIME Chemicals or KODAK MX-1888 Chemicals with your System 89 DLS Minilab at the slower processor speed, you will need to arrange to make adjustments to the processor. You must increase the transport speed and modify the chemical addition rates before you can use EKTACOLOR Rapide Chemicals. EKTACOLOR Rapide Chemicals are not compatible with minilabs operating at the lower transport speed, and EKTACOLOR PRIME Chemicals are not compatible with minilabs operating at the faster transport speed. See "Converting the Processor to KODAK EKTACOLOR Rapide Chemicals."

Table 1 lists the processing capacities of the bottles of concentrate.

Table 1
Processing Capacities

KODAK EKTACOLOR Chemical	Processing Capacity with KODAK EDGE Plus and ROYAL Plus Papers
	Europe, Africa, and Middle East
Rapide Developer Replenisher	One bottle of concentrate (CAT No. 680 1526): 120 m ²
Rapide Bleach-Fix and Replenisher	One bottle of Part A and one bottle of Part B (CAT No. 680 1534): 116 m ²
Rapide Stabilizer and Replenisher	One bottle of concentrate (CAT No. 680 1542): 258 m ²
	One bottle makes 100 litres of replenisher (may be prepared 10 litres at a time).

The System 89 DLS Digital Minilab automatically delivers the developer and bleach-fix to the tanks in the processor. You do not need to mix replenisher solutions for these chemicals. The processor automatically determines the amount of paper processed and delivers the necessary amounts of concentrate and water directly to the appropriate tank. The bottles of developer and bleach-fix concentrates attach to plumbing connections. You will need to mix EKTACOLOR Rapide Stabilizer and Replenisher in the replenisher tank by adding water to the concentrate. Then the minilab will deliver the mixed replenisher to the stabilizer tanks automatically.

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PROCESS SPECIFICATIONS

The specifications for using EKTACOLOR Rapide Chemicals in the System 89 DLS Digital Minilab are given in Table 2.

Table 2
Processing Steps and Conditions for Process RA-RC
in the System 89 DLS Digital Minilab

Solution/ Step	Time [§] (seconds)	Temperature °C (°F)	Starting-Point Replenishment Rate for Rapide Developer and Rapide Bleach-Fix (mL/m ²)	Starting-Point Replenishment Chimie-Screen Ratios for Rapide Developer and Rapide Bleach-Fix (%)
Developer	20.0 – 21.0	40.0 ± 0.3 (104.0 ± 0.5)	108	Concentrate: 0.10 Water: 0.90
Bleach-Fix	20.0 – 21.0	35 to 40 (95 to 104)	108	Part A Concentrate: 0.20 Part B Concentrate: 0.20 Water: 0.60
Stabilizer	50.0 – 53.0	34 to 40 (93 to 104)	388	Replenisher 1.00
Dry	As needed	75 (167) to 96 (205)	—	—

[§] Immersion time plus crossover time to the next tank.

Replenishment Rates

The replenishment rates in Table 2 are starting-point recommendations. The actual rates will depend on specific processing conditions such as the amount of paper processed and the proportion of high- and low-density prints.

The bleach-fix replenishment rates assume minimum developer carryover. If carryover is greater than normal, increase the bleach-fix replenishment rate to maintain the bleach-fix chemical balance and pH level. Otherwise, problems such as retained silver may occur. Retained silver will cause print colors to look desaturated. See the equipment manual for specifications and adjustments for squeegees or squeegee rollers.

Agitation

Good agitation is important during the first few seconds of the developer and bleach-fix steps. If initial agitation is poor in the developer, development may be uneven. Poor initial agitation in the bleach-fix may not stop development uniformly, which can cause magenta streaks and non-uniformity.

Filtration

Processing solutions and wash water may contain insoluble materials. If you don't filter out these materials, they may stick to the paper, tank walls, rollers, and lines, and can damage the paper. It is also important to replace solution filters periodically so that a blocked filter does not reduce solution flow. Use the filters designed for the processor and recommended in the equipment manual.

Drying

The maximum drying temperature for KODAK EDGE PLUS and ROYAL Plus Papers is 96°C (205°F). The ambient conditions of your lab may require adjustment of the drying temperature; typically 75°C (167°F) is an effective starting point.

Low Utilization

The number of prints that you produce each week determines the processor utilization. If your processor utilization is low, oxidation and evaporation will affect the activity of your processing solutions and may increase the D-min of the paper.

During periods of low utilization, be sure to turn off the processor when it's not in use to avoid oxidation and evaporation. In extreme cases of low utilization, you may need to discard the chemicals in the processor and replace them with fresh tank solutions. You can often reduce high D-min in prints by replacing the stabilizer with fresh solution.

SAFE HANDLING OF PHOTOGRAPHIC CHEMICALS

Handle all chemicals carefully. When you mix solutions, wear goggles or a face shield, a protective apron, and protective gloves made from neoprene or nitrile rubber. Clean protective clothing after use to remove any chemical residue that can cause contamination. For more information about potential health hazards and safe handling of specific Kodak chemicals, see the chemical labels and the Material Safety Data Sheets (MSDSs) for the chemicals. MSDSs also provide regional contact information. MSDSs are available on the Kodak website at www.Kodak.com/go/photochemicals.

CONVERTING THE MINILAB TO KODAK EKTACOLOR RAPIDE CHEMICALS

If you are currently operating with KODAK EKTACOLOR PRIME or KODAK MX-1888 Chemicals, the following procedure describes the steps required to convert your System 89 DLS Digital Minilab to the new Process RA-RC cycle and EKTACOLOR Rapide Chemicals. Equipment, software, and chemical modifications are required.

Equipment Conversion

Before converting the chemicals in the minilab, contact your equipment representative and arrange a service call to modify the processor. An increase in the paper transport speed will reduce the developer time from 30 seconds to the 20 seconds required for Process RA-RC. (Your current chemicals will be too low in activity for use at the shorter process time.) You may also need to increase the drying temperature after the transport speed increase. Software upgrades will also be needed.

Chemical Conversion

Replenishers. Remove the EKTACOLOR PRIME Developer and Bleach-Fix or KODAK MX-1888 chemical concentrates from the processor. Replace them with bottles of the new EKTACOLOR Rapide Chemicals (you will have partially used bottles of concentrates left from the tank conversions, described below).

Processor Tanks. When you begin using EKTACOLOR Rapide Chemicals, you have two options for conversion:

- Option 1: Remove a portion of the existing developer and bleach-fix tank solutions and modify each by adding developer concentrate and water or bleach-fix concentrate.
- Option 2: Drain the existing chemicals and start with fresh tank solutions.

Conversion Option 1—Modify Existing Tank

Solutions: If your System 89 DLS Digital Minilab has already been operating with modified KODAK EKTACOLOR PRIME Chemicals and is in good process control, you can convert the developer and the bleach-fix tank solutions before you begin using the EKTACOLOR Rapide Chemicals. With this method, you can preserve 70 percent of the developer and 92 percent of the bleach-fix tank solutions and avoid dumping the tanks. If your process is not in good control, the conversion may not be successful.

You can leave the existing stabilizer tank solutions in the processor; however, the conversion provides a good opportunity to replace the tank solutions with fresh mixes.

Note: Before making the conversion, see the Material Safety Data Sheets for all chemicals, taking special note of warnings and recommendations for protective measures. When disposing of any chemical during this conversion, follow all regional and local regulations.

Follow this procedure to convert an existing developer tank:

Developer Tank Conversion	Volume
Remove partial volume from developer tank	2.7 litres
Add portion of one bottle of EKTACOLOR Rapide Developer Replenisher concentrate	300 mL
Add water to developer tank	2.4 litres
Final tank volume	9 litres

Follow this procedure to convert an existing bleach-fix tank:

Bleach-Fix Tank Conversion	Volume
Remove partial volume from bleach-fix tank	720 mL
Add portion of bottle of EKTACOLOR Rapide Bleach-Fix and Replenisher concentrate, Part A	360 mL
Add portion of bottle of EKTACOLOR Rapide Bleach-Fix Replenisher concentrate, Part B	360 mL
Final tank volume	9 litres

Conversion Option 2—Drain the Tanks and Start with Fresh Solutions: To prepare fresh developer and bleach-fix tank solutions, follow the instructions in the next section.

PREPARING FRESH TANK SOLUTIONS

Follow these instructions to prepare fresh working tank solutions for the System 89 DLS Digital Minilab from EKTACOLOR Rapide Chemical concentrates. Observe all safe-handling precautions on the chemical labels and in the MSDS for each product.

Preliminary Steps

Use the following concentrates to prepare developer, bleach-fix, and stabilizer tank solutions:

KODAK EKTACOLOR Chemical Concentrate	
Rapide Developer	Part of one bottle
Rapide Bleach-Fix and Replenisher	Part of one bottle of Part A and part of one bottle of Part B
Rapide Stabilizer and Replenisher	One bottle of replenisher concentrate split among three tanks (180 mL for each tank)

For the developer, you will also need KODAK EKTACOLOR RA Developer Starter, CAT No. 527 8957.

You will need a device for measuring solution volumes up to about 600 millilitres, such as a graduated cylinder. You will also need to measure up to 10 litres of water.

The following instructions assume that you will mix the tank solutions directly in the processor tanks. You can also mix them in separate mixing vessels.

Remove the racks from the processor tanks, and rinse the racks and tanks with water. Be sure to drain all rinse water from the tanks and close the drain valves before adding the new solutions.

Stabilizer

Use the EKTACOLOR Rapide Stabilizer and Replenisher concentrate dispensing bottle to mix the working tank solution directly in *each* of the three stabilizer tanks.

For Each Stabilizer Tank	Volume
Add water to each tank	9.80 litres
Add stabilizer concentrate	Release bottle cap and squeeze dispenser bottle to fill to –A– line two times (180 mL total)
Total volume per tank	10 litres

Bleach-Fix

You can mix the bleach-fix tank solution directly from the two-part concentrate in the tank. **Be very careful to avoid contamination of the developer with bleach-fix solutions.**

For Bleach-Fix Tank	Volume
Add water	5.4 litres
Add part of one bottle of bleach-fix concentrate, Part A	1.8 litres
Add part of one bottle of bleach-fix concentrate, Part B	1.8 litres
Total tank volume	9 litres

Note: you will have about 30 percent of the contents left in each of the two bleach-fix concentrate bottles after mixing the solution. You can install the partially used bottles in the processor to replenish the bleach-fix tank.

Developer

To ensure good performance, take special care in mixing the developer tank solution.

For Developer Tank	Volume
Add water	8.14 litres
Add part of one bottle of developer concentrate	585 millilitres
Add EKTACOLOR RA Developer Starter (CAT No. 527 8957)	270 millilitres
Total tank volume	9 litres

Note: You will have extra developer concentrate left in the concentrate bottle after mixing the tank solution. You can install the partially used bottle in the processor to replenish the developer tank.

Reinstalling the Racks and Bringing the Tank Solutions to Temperature

The tanks will appear only partially filled after you have added the solutions. When you reinstall the racks in the tanks, the racks will displace more solution volume to fill the tanks.

Install the racks by slowly lowering them into the tanks. When you have reinstalled all the racks and have verified that all the tanks are filled with solution, turn on the recirculation and heater system and bring the solutions up to operating temperature.

USING CONTROL STRIPS TO MONITOR THE PROCESS

Use KODAK Control Strips, Process RA-4 (box of 50, CAT No. 828 2170), to monitor process performance. For instructions on processing control strips, see the operator's manual for the System 89 DLS Digital Minilab. For information on the use and diagnostic features of the control strips, see KODAK Publication No. Z-130, *Using KODAK EKTACOLOR Chemicals*, Section 7, "Process Monitoring and Troubleshooting with KODAK Control Strips, Process RA-4." Kodak publications are described and available on the Kodak website at www.Kodak.com/go/photochemicals.

To calculate control-strip aim values for process monitoring, you will need to apply process adjustment factors. Use the adjustment factors in addition to the correction factors that are supplied with the control strips.

After reading the densities of the supplied reference strip on your densitometer, first apply the correction factors packaged with the reference strip. Use the correction factor designated for "Prime" chemicals. Then add the adjustment factors from the following table. The corrected density values are the aim values for your batch of control strips. You will need to apply the adjustment factors each time you switch to a new batch of control strips.

Table 3
Process Adjustment Factors with
KODAK Control Strips, Process RA-4
(CAT No. 828 2170)

Control-Strip Code Numbers 3031 and Higher

Measurement	R	G	B
Black (BP)	+0.08	+0.08	+0.01
High (HD)	+0.08	+0.17	0
Low (LD)	+0.10	+0.16	0
D-min	0	0	+0.01

Table 4 provides an example calculation of the correction factors and control strip aim—in this case, for Code 3068. Use the correction factors for your specific control strip code. The second column of Table 4A has the correction factors taken from the small sheet packaged with the reference strip for Code 3068; the values are for EKTACOLOR PRIME and RA Developer Replenisher. The third column has the adjustment factors taken from the first table in Table 3 for control codes greater than or equal to Code 3031. The fourth column is the sum of columns two and three. Apply the revised correction factors to the density reading you obtain from the reference strip for Code 3068.

As shown in Table 4B, add your density readings and the revised correction factors from Table 4A, paying attention to the signs, to produce the final aim for your process and densitometer. Compare your density readings of processed control strips with this aim to determine the status of your process.

Example: Determination of Control Strip Aim

Table 4A—Determination of Revised Correction Factors

Measurement	Correction Factors for Code 3068	System 89 Adjustment Factors from Table 3A	Revised Correction Factors
Black BP-R	-.11	+.08	-.03
Black BP-G	+.02	+.08	+.10
Black BP-B	+.01	+.01	+.02
High HD-R	+.01	+.08	+.09
High HD-G	+.01	+.17	+.18
High HD-B	+.05	0	+.05
Low LD-R	+.04	+.10	+.14
Low LD -G	-.02	+.16	+.14
Low LD -B	+.06	0	+.06
D-min R	0	0	0
D-min G	+.01	0	+.01
D-min B	+.02	+.01	+.03

Table 4B—Determination of Control Strip Aim

Measurement	Typical Density Readings for Code 3068	Revised Correction Factors from Table 4A	Aim for Code 3068
Black BP-R	2.16	-.03	2.13
Black BP-G	2.09	+.10	2.19
Black BP-B	2.10	+.02	2.12
High HD-R	1.58	+.09	1.67
High HD-G	1.61	+.18	1.79
High HD-B	1.53	+.05	1.58
Low LD-R	0.74	+.14	0.88
Low LD -G	0.83	+.14	0.97
Low LD -B	0.69	+.06	0.75
D-min R	0.08	0	0.08
D-min G	0.08	+.01	0.09
D-min B	0.08	+.03	0.11

The Contrast, HD-LD, aim is determined from the values in the fourth column of Table 4B. Subtract the respective LD value from the HD value for each color as shown in Table 5.

Table 5—Calculating HD-LD

	HD	LD	HD-LD
R HD-LD	1.67	0.88	0.79
G HD-LD	1.79	0.97	0.82
B HD-LD	1.58	0.75	0.83

SILVER RECOVERY

The overflows from the bleach-fix and stabilizer tanks are collected in separate effluent tanks in the System 89 DLS Digital Minilab. When an effluent tank is full, the processor alerts you to drain the tank.

Typically, silver concentration in the bleach-fix effluent tank will be 4 to 8 g/L; silver concentration in the stabilizer effluent tank will be 0.2 to 0.6 g/L.

You can effectively use common silver-recovery methods with the combined effluents from both effluent tanks. If your lab has other processors, you can combine the effluent from the System 89 DLS Minilab with the other effluent solutions and use your current silver-recovery methods.

Publications on silver management that include recommendations and descriptions of silver-recovery options are available in the Silver Management section of the Kodak Environmental Services Publications Center at www.kodak.com/go/KES.

DISPOSAL AND RECYCLING OF CHEMICAL BOTTLES

You can help minimize solid waste by participating in your local community recycling program. The following information will help you to prepare the empty plastic bottle for disposal or recycling.

1. When handling the bottles and solutions, follow the recommendations for **personal protection and ventilation**, as described in the product Material Safety Data Sheet (MSDS).
2. When you need to replace an empty chemical bottle in the processor, open a new bottle of concentrate.
3. Remove the empty bottle from the processor. Over a sink, pour any remaining solution from the old bottle into the new bottle of concentrate. (It may take several moments for the solution to drain.)

Note: The contents of this publication are subject to change. To be sure you have the most up-to-date publication, check www.kodak.com/go/photochemicals; select Technical Information to find *Current Information Summaries*.

4. Wipe the outside of the new bottle to remove any chemical residue, and install it in the processor.
5. Slowly rinse the bottle cap and empty container with **cold** water to minimize splattering and respiratory exposure. Dispose of the rinse water in accordance with all regulations.
6. Repeat the rinsing procedure. You may use warm water (approximately 38°C [100.4°F]) for the final rinse to increase the solubility of any remaining chemicals. Our standard recommendation is to rinse **at least three times**.
7. When you no longer need the bottle caps, rinse and discard them. Do not place them in the recycling container.
8. If the bottle has visible stains or residue after rinsing, do not recycle it. Dispose of it in accordance with local regulations.
9. Split plastic bottles so that they cannot be reused, and place them in your recycling container or dispose of them in accordance with local regulations.

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