



# SERVICE BULLETIN

## KODAK X-OMAT Processor

Eastman Kodak Company, Health Imaging, Rochester, New York 14650

SERVICE BULLETIN NO. 244

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### All KODAK X-OMAT Processors

#### Conversion Instructions and Processing Recommendations for KODAK MIN-R 2000 Film

This bulletin documents the current processing recommendations for KODAK MIN-R 2000 Film with KODAK *RP* X-OMAT Products. This data supersedes all previous information given in publications for KODAK X-OMAT Products.

KODAK MIN-R 2000 Film is designed for standard cycle processing. All KODAK X-OMAT Processors should be adjusted to comply with the standard cycle processing parameters listed in the film processing instructions for that specific processor.

#### Note

The KODAK X-OMAT M43, M43A, and Clinic 1 Processors are not recommended for processing KODAK MIN-R 2000 Film. Processors with shallow developer tanks or short developer racks are not recommended for processing KODAK MIN-R 2000 Film.

#### [1] Processors.

- KODAK X-OMAT 460 RA, 480 RA, and 270 RA Processors:
  1. On the Display Panel, select the "STD Cycle" key for standard cycle processing.
  2. Check that all settings are set for standard cycle default values.
  3. Process KODAK MIN-R 2000 Film emulsion-side up.

#### Note

- Upgraded software may be required if processing less than 260 18 x 24 cm size sheets (or equivalent) per 8 hr shift unless the Processor is operating in the flooded replenishment mode. If needed, order:

Processor	Disk (There is no charge.)	PROM Set (There is a charge.)	Version No.
270 RA	9B8537	9B8533, except Japan	3.0
		9B8535, Japan	
460 RA	9B8530	9B8526, except Japan	3.0
		9B8528, Japan	
480 RA	8B7098	8B7094, except Japan	3.0
		8B7095, Japan	

- KODAK X-OMAT 3000 RA and 5000 RA Processors:
  1. On the Display Panel, select the “STD Cycle” key for standard cycle processing.
  2. Check that all settings are set for standard cycle default values.
  3. Process KODAK MIN-R 2000 Film emulsion-side up.

## Note

- You will need to enable a special feature in the software if processing less than 260 18 x 24 cm size sheets (or equivalent) per 8 hr shift, unless the Processor is operating in the flooded replenishment mode. See the procedure below.
- This special feature is only available in software Version 3.0 or higher for both the 3000 RA and 5000 RA Processors. If necessary, order:

<b>Processor</b>	<b>Disk (There is no charge)</b>	<b>PROM Set (There is a charge)</b>	<b>Version No.</b>
3000 RA	8B6721	not available	3.31
5000 RA	9B8247	not available	3.30

To enable the special feature in the software on 3000 and 5000 RA Processors:

- a. Energize the Processor if it is not already energized.
- b. Change the state of the 5000 Board Dip Switch No. 2.  
Note: The initial position of the Switch is not important. The change is what is required.
- c. Enter the code “3 2 4 4” within 20 seconds.  
Note: The Replenishment Mode Screen displays a special symbol in the upper right corner after you enable the special feature.

## • KODAK X-OMAT Multiloader 300

1. On the Display Panel, select the “STD Cycle” key for standard cycle processing.
- Film is processed emulsion-side down in the Multiloader 300.
  - If marks from the Guide Shoes appear on KODAK MIN-R 2000 Film and are a customer concern, install the Smooth Guide Shoe Kit in the Developer Rack. Order the Smooth Guide Shoe Kit for the Multiloader 300, Part No. 1C7119, from Service Parts Management, 1-800-431-7278.
  - If film sensing problems occur, install Multiloader 300 Modification No. 38.
  - Upgraded Processor software may be required if processing less than 260 18 x 24 cm size sheets (or equivalent) per 8 hr shift, unless the Processor is operating in the flooded replenishment mode. If needed, order:

<b>Processor</b>	<b>Disk (There is no charge)</b>	<b>PROM Set (There is a charge)</b>	<b>Version No.</b>
270 RA	9B8537	9B8533, except Japan	3.0
		9B8535, Japan	

- KODAK X-OMAT M6B, M6A, and M6AW Processors

1. Set the developer temperature and the transport speed for standard cycle processing.
2. Process KODAK MIN-R 2000 Film emulsion-side up.
3. If necessary, order the following parts from Service Parts Management (1-800-431-7278) to change an M6 Series Processor from extended to standard cycle:

For the Drive Motor	Sprocket - 20 Tooth	454454
	Setscrew	852558
For the Drive Shaft	Sprocket - 19 Tooth	458187
	2 Setscrews	852558
For the Chain	Drive Chain	469349
	Master Link	454260

- KODAK X-OMAT M7B Processors:

1. Set the developer temperature and the transport speed for standard cycle processing.
2. Process KODAK MIN-R 2000 Film emulsion-side up in a M7B Processor.
3. If necessary, order the following parts from Service Parts Management (1-800-431-7278) to change an M7B Processor from extended to standard cycle:

For the Drive Motor	Sprocket - 19 Tooth	532247
For the Chain	Drive Chain	532248
	Master Link	188967

- KODAK X-OMAT M35A-M and M35-M Processors:

1. Set the STD/EXT switch to “STD”
2. Due to non-uniformity issues, we recommend processing KODAK MIN-R 2000 Film emulsion-side down in an M35A-M or M35-M Processor.

### **Note**

Use of a Miniloader with an M35-M Processor results in film being processed emulsion-side down.

If marks from the Guide Shoes appear on KODAK MIN-R 2000 Film when processing film emulsion-side down, install Smooth Guide Shoes in the Developer Rack. Order the Smooth Guide Shoe Kit for the M35 Series Processors, Part No. 7C7865, from Service Parts Management, 1-800-431-7278.

- KODAK X-OMAT M35 and M35A Processors:

1. Set the developer temperature and the transport speed for standard cycle processing.
2. Due to non-uniformity issues, we recommend processing KODAK MIN-R 2000 Film emulsion-side down in a M35A Processor.
3. If necessary, order the following parts from Service Parts Management (1-800-431-7278) to change an M35A Series Processors from extended to standard cycle:

For the Drive Motor	For M35A Serial Number 7999 or below	Sprocket - 20 Tooth	240735
For the Drive Shaft	For all M35 and M35A Processors Serial Number 8000 or above	Sprocket - 17 Tooth	466640
For the Chain		Drive Chain	480168
		Master Link	454260

### Note

If marks from the Guide Shoes appear on MIN-R 2000 Film when processing film emulsion-side down, install Smooth Guide Shoes in the Developer Rack. Order a Smooth Guide Shoe Kit for M35A and M35A-M Processors, Part No. 7C7865, from Service Parts Management, 1-800-431-7278.

### [2] Chemicals.

- Drain, clean, and refill the Developer and Fixer Tanks.
- KODAK MIN-R 2000 Film requires 6 fluidounces per gallon of KODAK *RP* X-OMAT Developer Starter. See the General Processor Information in Service Bulletin No. 30 for recommended starter volumes for a specific processor.

Optimum results are obtained using KODAK *RP* X-OMAT Developer Replenisher. Other manufacturers' developers may provide acceptable results. Contact the developer manufacturer for recommended replenishment rates. If you are attempting to use another manufacturer's developer, use 6 fl oz per gallon of KODAK *RP* X-OMAT Developer Starter only.

Optimum results are obtained using KODAK *RP* X-OMAT *LO* Fixer and Replenisher. Other manufacturers' fixer may provide acceptable results. Contact the fixer manufacturer for recommended replenishment rates.

### [3] Adjust the developer and fixer replenishment rates.

Dedicated Processing: KODAK MIN-R 2000 Film requires specific replenishment rates for developer and fixer. See the Processing Recommendations in Service Bulletin No. 30. These recommendations are guidelines for KODAK *RP* X-OMAT Developer Replenisher and KODAK *LO* Fixer and Replenisher. Developer and fixer replenishment rates may require adjustment for specific processing environments. For other manufacturers' developers and fixers, contact the manufacturer for recommended replenishment rates.

Non-Dedicated Processing: KODAK MIN-R 2000 Film can be processed with other types of medical x-ray film. Use 6 fl oz per gallon of KODAK *RP* X-OMAT Developer Starter for non-dedicated processing environments. KODAK MIN-R 2000 Film requires specific replenishment rates for developer and fixer. See the Processing Recommendations for Non-Dedicated Processing in Service Bulletin No. 30. These recommendations are guidelines for KODAK *RP* X-OMAT Developer Replenisher and KODAK *LO* Fixer and Replenisher. Developer and fixer replenishment rates may require adjustment for specific processing environments. For other manufacturers' developers and fixers, contact the manufacturer for recommended replenishment rates.

Flooded Replenishment: Flooded replenishment can be used to help maintain stable processor quality control. For KODAK MIN-R 2000 Film, it requires 6 fluidounces per gallon of KODAK *RP* X-OMAT Developer

Starter in the external developer replenishment tank. See the recommendations for Flooded Replenishment Rates in Service Bulletin No. 30.

**[4] Dryer Temperature.**

Processors converted from extended to standard cycle processing may require an adjustment in the Dryer temperature to maintain adequate drying. Set the Dryer temperature to the minimum required to produce dry film. Tacky or wet films occurring even with adjusted Dryer temperatures may indicate that additional service is required. Check that the Dryer Air Tubes are in the correct positions. Remove any dirt from the Dryer Rollers and Air Tubes, especially the slots. Check the settings for correct replenishment. Check the replenishment system for kinks in the Tubing, the operation of the Recirculation and Replenishment Pumps, and the Detector Switches. Change any chemicals that were not mixed correctly, are exhausted, or are contaminated. Check that the Dryer air exhaust is free from any obstructions and is installed correctly according to the specifications in the installation instructions.

**[5] Phototimer Exposure.**

Using the phantom used for the ACR Accreditation Program or an equivalent phantom, calculate any difference in exposure requirements using the customer's current screen/film system and the new screen/film system. KODAK MIN-R 2000 Film with a KODAK MIN-R 2000 Screen has a relative speed of 150. KODAK MIN-R 2000 Film with a KODAK MIN-R Screen has a relative speed of 100. Phototimer recalibration may be required to match optical densities.

**[6] Processor Quality Control Operating Levels**

- (a) Using a Sensitometer, expose and process a Sensitometric strip. Repeat this exposure and processing once each day for five consecutive days.

For the KODAK Process Control Sensitometer, the following Dip Switch settings are recommended for KODAK MIN-R 2000 Film:

SINGLE and GREEN settings at Exposure Setting No. 4

- 1-down, 2-down, 3-up, 4-down
- (b) Read and record the densities of each step of the sensitometric strip using the densitometer, including an area of processed film which has not been exposed.
- (c) Determine the average of the densities for each step using the densities for that step from the five strips.
- (d) Determine which step has an average density closest to 1.20. Designate this step the mid-density (MD) step.
- (e) Determine which step has a density closest to 2.20 and which step has a density closest to but not less than 0.45. The difference in densities between these two steps should be designated as the density difference (DD).
- (f) Determine the average of the densities from the unexposed area of the five strips. This density will be designated as the base-plus-fog level (B+F) of the film.
- (g) Start a new Processor quality control chart and record the numerical values of the MD, DD and B+F on the center line of the appropriate areas of the control chart.

**[7] Other Mammography Quality Control Tests**

- Phantom Images  
Perform the test as described in the ACR QC Manual. Note any changes in the number of test objects seen. Re-establish the baseline numbers. The density difference on the phantom may be significantly higher due to the high contrast of KODAK MIN-R 2000 Film.
- Screen-Film Contact  
Perform the test as described in the ACR QC Manual.

- Darkroom Fog Test  
Perform the test as described in the ACR QC Manual.
- Analysis of Fixer Retention in Film  
Perform the test as described in the ACR QC Manual.
- Uniformity of Screen Speed  
Perform the test as described in the ACR QC Manual.
- Artifact Evaluation  
Perform the test as described in the ACR QC Manual.

**For More Information:**

**U.S. Distributors Contact:**

Health Imaging  
Customer Support Operations  
1-800-336-4722

**CES Personnel Contact:**

Film Handling TAC  
U.S.: 1-800-822-1414  
Canada: 1-800-433-1414  
International: 716-724-4675

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